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BOTANICAL MAGAZINE,

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Plants of the Royal Botanic Gardens of Kew,

AND OF OTHER BOTANICAL ESTABLISHMENTS;

EDITED BY

SIR DAVID PRAIN, C.M.G., C.I.E., LL.D., F.R.S.,

DIRECTOR, ROYAL BOTANIC GARDENS, KEW.

VOL. VIII.
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Nature's own sweet and cunning hand laid on."

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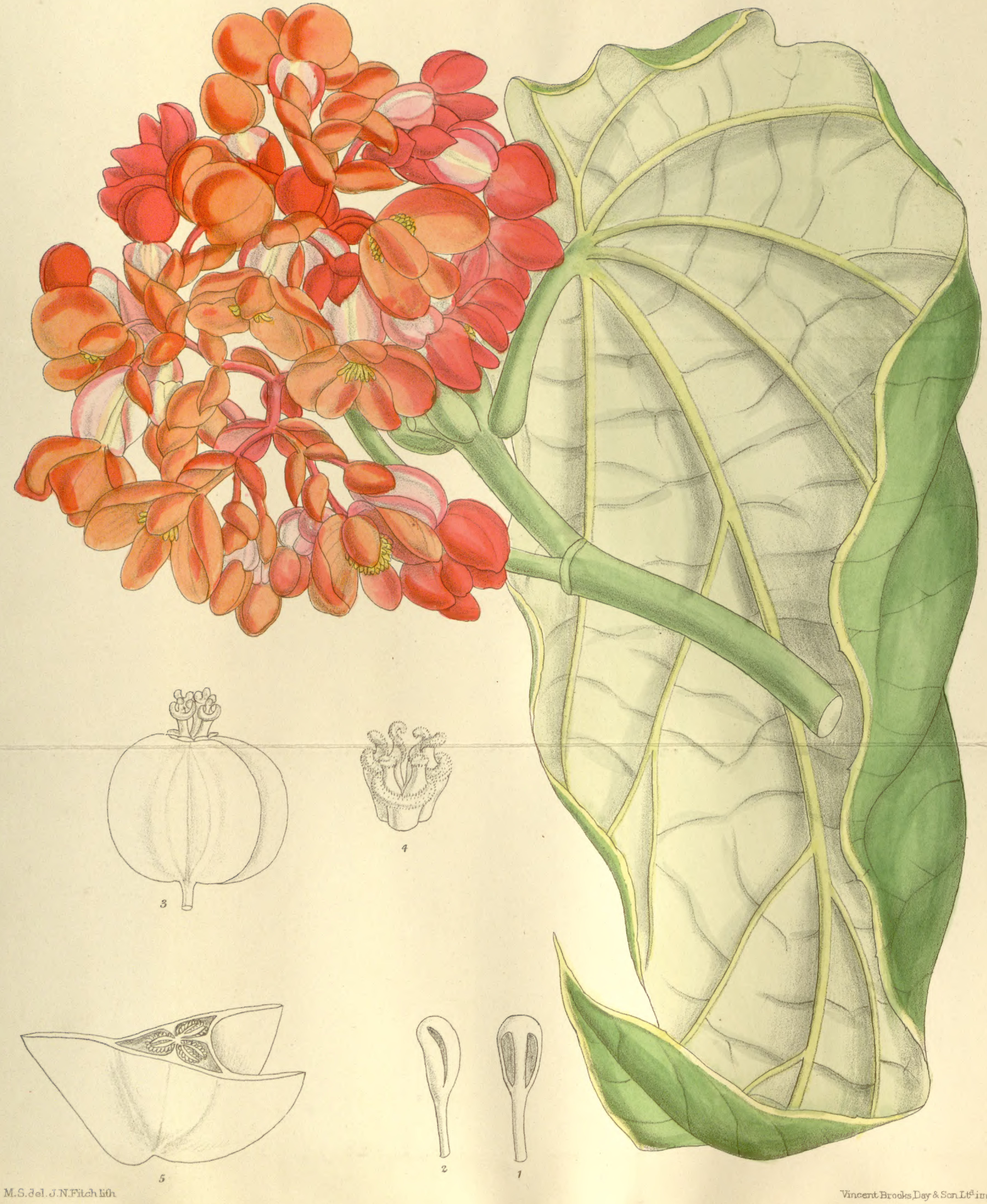

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TAB. 8412.

BEGONIA DICHROA.

Brazil.

BEGONIACEAE.

BEGONIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 841.

Begonia (Knesebeckia) dichroa, *Sprague in Oestr. Gart. Zeit.* 1907, p. 418, *et in Kew Bull.* 1908, p. 251; floribus masculis coccineis, femineis albococcineis distincta.

Planta elata, glabra, pilis minutis moniliformibus glandulosis in innovationes et inflorescentiam adspersis exceptis. *Folia* plantae juvenilis rhomboideo-elliptica, semicordata, acuminata, 10–12 cm. longa, 5–5·5 cm. lata, albomaculata; folia plantae adultae ovato-oblonga, acute acuminata, basi valde obliqua, semicordata, 8-nervia nervis infimis parvis inconspicuis superne nervis utrinque 3–5 penninervia, 22–30 cm. longa, 9–13·5 cm. lata, margine leviter undulata, supra saturate viridia, nitidula, subtus pallida; petioli 2–5 cm. longi; stipulae ovatae, acute acuminatae, 2–5 cm. longae, 1·5 cm. latae. *Pedunculus* 3–6·5 cm. longus. *Dichasium* multiflorum, floribus masculis terminalibus, femineis axillaribus. *Bracteae* cymbiformes, in statu explanata ovatae, obtusae, 1–1·5 cm. longae, 0·8–1 cm. latae, ut rhachis coccineae. *Flores* masculi pedicellis circiter 2 cm. longis. *Perianthii* segmenta 4, coccinea, 2 exteriora late obovata, obtusa, 2·3 cm. longa, 1·9 cm. lata, 2 interiora oblanceolata, rotundata, 1·2 cm. longa, 4–5 mm. lata. *Stamina* in toro convexo 1·5 mm. alto insidentia; filamenta 2–3 mm. longa; antherae obovoideo-oblongae, vix 1·5 mm. longae, loculis versus basin convergentibus. *Flores* feminei sessiles vel breviter pedicellati. *Perianthii* segmenta coccinea, 5, quorum 2 exteriora late obovata, obtusa, 1·4 cm. longa, 1·1 cm. lata, intimum oblongum, rotundatum, 7–8 mm. longum, vix 4 mm. latum, cetera 2 intermedia. *Ovarium* 3-loculare, 1·5 cm. longum, primum album, tandem purpureo-tinctum, alis 6–7 mm. latis, placentis bipartitis undique ovuliferis. *Styli* basi brevissime connati, 3–3·5 mm. longi, bifurcati, ramis vix ultra 1 mm. longis in helicem sesquicyclicam tortis, papillis stigmaticis externe infra furcam continuis.—T. A. SPRAGUE.

The interesting *Begonia* which forms the subject of our illustration was obtained for the Kew collection in 1907 from Messrs. Haage & Schmidt, Erfurt. It occupies a somewhat isolated place within the section *Knesebeckia*, yet while this is its most satisfactory systematic position as the species of this extensive genus are at present classified, it bears a striking resemblance to *B. maculata*, Raddi, a species which belongs, however, to the section *Gaerdtia*, in which the two segments of the placenta bear ovules on their outer surfaces only. The most natural explanation of this

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peculiar combination of characters that can be suggested is that *B. dichroa* may be a hybrid between two species belonging to different sections. Yet in the present instance this explanation is perhaps not the true one, because *B. dichroa* has matured seeds at Kew, and the resulting plants have proved to be exactly like the parent one. It is, however, just possible that too great stress has been laid on the character afforded by the circumstance that the segments of the placenta bear ovules on one side only, or on both surfaces. *B. dichroa* is a species that requires tropical conditions. It has large leaves and is of a somewhat lax habit; for a *Begonia* its growth is slow. The flowers, which are produced in spring, are remarkable for their shining orange-scarlet colour, a tint unlike that of any of the other cultivated species included in the group known in gardens as shrubby Begonias.

DESCRIPTION.—*Herb*, tall, with minute scattered beaded glandular hairs on the young shoots and inflorescence, otherwise glabrous. *Leaves* in young plants rhomboid-elliptic, semicordate, acuminate, 4–5 in. long, 2 in. wide or rather wider, blotched with white; in full-grown plants ovate-oblong, sharply acuminate, base semicordate but very oblique, 8-nerved with the lowest pair small and inconspicuous, higher up with the nerves again pinnately 3–5-nerved on each side, 9–12 in. long, 4½–5½ in. wide, margin slightly undulate; deep green above, somewhat polished, pale beneath; petiole ¾–2 in. long; stipules ovate, sharply acuminate, 1 in. long, 7 lin. wide. *Peduncle* 1¼–2½ in. long. *Dichasium* many-flowered, the male flowers terminal, the female axillary. *Bracts* cymbiform, ovate when outspread, obtuse, 5–7 lin. long, 4–5 lin. wide, pink like the rachis. ♂ *Flowers* pedicelled, about 10 lin. long. *Perianth-segments* 4, pink, the outer pair wide obovate, obtuse, nearly 1 in. long, ¾ in. wide, the inner pair oblanceolate, rounded, ½ in. long, 2–2½ lin. wide. *Stamens* inserted on a convex raised receptacle; filaments short; anthers obovoid-oblong, very short, their cells convergent towards the base. ♀ *Flowers* sessile or shortly pedicelled. *Perianth-segments* 5, pink, the two outermost wide obovate, obtuse, 7 lin. long, about 5 lin. wide, the innermost oblong, rounded, 3½–4 lin. long, barely 2 lin.

wide, the remaining two intermediate in size and form. *Ovary* 3-celled, about 8 lin. long, at first white, ultimately with a purplish tinge; wings 3–3½ lin. wide; placentas 2-partite, their lamellae bearing ovules on both faces. *Styles* shortly united at the base, under 3 lin. long, bifurcate, their arms very short and helicoidly twisted, the stigmatic papillae extending downwards beyond the point of bifurcation.

Figs. 1 and 2, anthers; 3, a female flower, the perianth segments removed; 4, stigmas; 5, ovary in section:—*all enlarged.*

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TAB. 8413.

ELLIOTTIA RACEMOSA.

Southern United States.

ERICACEAE. Tribe RHODOREAE.

ELLIOTTIA, *Muhl. ex Ell. Sketch Bot. S. Car. & Georg.* vol. i. p. 448; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 598, *partim*; *Drude in Engl. & Prantl, Nat. Pflanzenf.* vol. iv. pars 1, p. 32.

Elliottia racemosa, *Muhl. Cat. Pl. Am. Sept.* 1813 (nomen) *et ex Ell. Sketch Bot. S. Car. & Georg.* 1817, vol. i. p. 448 *et in Nutt. Gen. N. Am. add.* 1821; *Gray, Syn. Fl. N. Am.* vol. ii. pars 1, p. 44; *Sargent in Gard. & Forest*, vol. vii. p. 207, t. 37 *et in Sylva N. Am.* vol. xiv. p. 31, t. 712; *Kew Bull.* 1906, p. 226, et 1911, p. 322; species unica.

Arbor ad 6 m. alta vel saepius fruticosa, ramis virgatis novellis gracilibus pubescentibus castaneis, deinde aurantiaco-fuscis demum fusco-cinereis glabris. *Folia* alterna, oblonga vel elliptico-oblonga, utrinque acuta, 7–10 cm. longa, 2·5–3·75 cm. lata, membranacea, supra saturate viridia, glabra, infra pallida, laxe pilosa; petioli basi dilatati, pubescentes, 8–10 mm. longi. *Inflorescentiae* terminales, racemosae vel subpaniculatae, 15–25 cm. longae, laxae; bracteae bracteolaeque lanceolatae vel subulatae, scariosae, mox deciduae; pedicelli 10–15 mm. longi, graciles. *Calyx* patellari-cupularis, diametro 3–4 mm., rubescens, 4-lobus, lobis perlatis cuspidatis ciliolatis, praeter cilia glaber. *Petala* 4, ima basi leviter cohaerentia, anguste spathulato-oblonga, 10–12 mm. longa, 3 mm. lata, alba. *Stamina* 8; filamenta 5 mm. longa, linearia; antherae basi bilobae, oblongo-lanceolatae, 2·5 mm. longae. *Ovarium* disco crasso 4-lobo insidens, depressum, 4-loculare; stylus filiformis, superne incurvus incrassatusque, 8–9 mm. longus; stigma oblique capitatum. *Fructus* ignotus.—O. STAPF.

The beautiful shrub or small tree which forms the subject of our illustration is confined naturally to a small area in northern Georgia which extends across the Savannah River into South Carolina. Within this limited tract it is rare or at least local in woods, especially along rivers. The species was first received at Kew in 1894 from the late Mr. P. J. Berckmans, of Augusta, Georgia, who sent some pieces with a little root attached, accompanied by a note recording his having first noted it when botanising with the late Professor A. Gray some thirty years previously. Unfortunately none of the pieces grew, and it was not until 1902, when two well-rooted plants were again sent by Mr. Berckmans, that *Elliottia racemosa* became established in the Kew Collection. One of the plants has been injured as the result of attempts to propagate the species by root-cuttings; the other has grown well, and is now a shrub about seven feet high, which flowered for the first time in July, 1911. The two plants are situated in a bed of heaths where, to the ordinary sandy soil of Kew, have been added a little peat and some leaf soil. Conditions suitable for Rhododendrons and the Heath family generally appear to suit the *Elliottia* exactly. The great difficulty with this species is to propagate it; although the stigmas were carefully dusted with pollen and the flowers attracted many bees, not a single fruit was developed. Ordinary cuttings of the twigs have been tried several times without success. Layering is now being tried, but grafting, which suggests itself, seems excluded owing to the difficulty in finding a suitable stock.

DESCRIPTION.—*Shrub*, or small tree, 20–24 ft. high, twigs virgate, when young slender, pubescent, chestnut-brown, later orange-tawny, ultimately grey-tawny and glabrous. *Leaves* alternate, oblong or elliptic-oblong, acute, base cuneate, 2¾–4 in. long, 1–1½ in. wide, membranous, dark green above, glabrous, pale and loosely pilose beneath; petiole dilated below, pubescent, 4–5 lin. long. *Inflorescence* terminal, racemose or almost paniculate, 6–10 in. long, lax; bracts and bracteoles lanceolate or subulate, scarious, semi-deciduous; pedicels slender, 5–7 lin. long. *Calyx* flatly cupular, about 2 lin. across, reddish, 4-lobed, the lobes rather broad, cuspidate and ciliolate, but otherwise glabrous. *Petals* 4, white, slightly cuneate at the very base, narrow spathulate oblong, 5–6 lin. long, under 2 lin. wide. *Stamens* 8; filaments 2½ lin. long, linear; anther 2-lobed below, oblong-lanceolate, over 1 lin. long. *Ovary* resting on a thick 4-lobed disk, depressed, 4-celled; style filiform, thickened and incurved above, 4 lin. long; stigma obliquely capitate. *Fruit* unknown.

Fig. 1, bud; 2, calyx and pistil; 3, vertical section of calyx, disk and ovary; 4 and 5, stamens:—*all enlarged.*

8414.

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TAB. 8414.

BERBERIS WILSONAE.

China.

BERBERIDACEAE. Tribe BERBEREAE.

BERBERIS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 43.

Berberis Wilsonae, *Hemsl. in Kew Bull.* 1906, p. 151; *H. Spooner in Gard. Chron.* 1907, vol. xlii. p. 372; *Veitch in Cat. Nov.* 1907; species adspectu *B. Thunbergii* similis, differt spinis infra foliorum fasciculos 3, foliis crassissimis eximie reticulatis flores excedentibus et floribus numerosis minoribus in racemos congestos dispositis.

Frutex, tarde deciduus vel fere sempervirens, ad 1 m. altus, patulus; ramuli graciles, angulati, minute brunneo-pubescentes. *Folia* fasciculata oblanceolata vel anguste obovata, sessilia, apice rotundata mucronata vel subacuta, casu 3-partita, basi sensim attenuata, 0·6–2·5 cm. longa, 2–6 mm. lata, pallide viridia, supra opaca subtus glauca, conspicue reticulata; fasciculi in axillis spinarum 3-furcatarum dispositi; spinarum rami aciculati 1–2 cm. longi. *Flores* aureo-lutei, 1 cm. diametro, in fasciculos vel umbellas breve pedunculatas dispositi. *Sepala* 6, obovato-orbicularia, 2–3 mm. longa. *Petala* 6, obovata, sepalis paulo breviora. *Stamina* petalis breviora. *Fructus* globosus, 6 mm. diametro, pallide puniceus.—W. J. BEAN.

Among the many new forms belonging to the genus *Berberis* which recent exploration in China has disclosed, the subject of our plate is one of the most distinct and attractive. It is a native of Central and Western China, and was first met with by Mr. E. H. Wilson when collecting on behalf of Messrs. J. Veitch & Sons in the neighbourhood of Tatien-lu in 1903. The material for our figure has been derived from a plant presented to the Kew collection by Messrs. Veitch in 1907. But while very different from any of the species formerly known in gardens, *B. Wilsonae* appears to be one of a series of variable forms from the same general region rather than an isolated and well differentiated species. This conclusion is the result of an examination of a number of Chinese Barberies, palpably of the same type of *B. Wilsonae*, though noticeably different in their details, recently introduced to cultivation at Kew, Coombe Wood and elsewhere. Perhaps the most nearly allied of these forms is one which has been described as *B. parvifolia*, Sprague. Another form almost if not quite identical with *B. Wilsonae* was

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collected in Yunnan by Père Ducloux; his specimens are not definitely dated, but it is known that they were obtained some time prior to 1901. If *B. parvifolia* can be regarded as no more than a variety of the species to which *B. Wilsonae* belongs, then this species has been in cultivation at Kew since 1896, when seeds were received from St. Petersburg. As a garden plant *B. Wilsonae* has attractions in its flowers, which appear during July and August; in its fruit, which ripens in October; and, according to Wilson, in the brilliant autumnal tints of its foliage. It is, however, necessary to remark that, at Kew, the last-mentioned characteristic has not been strikingly manifested; indeed, the young plants grown here have shown a marked tendency to retain much of their foliage throughout the winter. The dwarf, spreading habit of the plant renders it suitable for the rock-garden in a sunny position where its branches can overhang some miniature cliff. It prefers a loamy soil and is very easily increased by means of seeds.

Description.—A deciduous or sub-evergreen *shrub* of low, spreading habit, 2 to 4 ft. high; branchlets slender, zig-zag, angled, clothed with a minute, dark-brown pubescence. *Leaves* in fascicles produced in the axils of triple-forked spines, each fork acicular, $\frac{3}{8}$ to $\frac{3}{4}$ in. long; oblanceolate or narrowly obovate, sessile, the apex rounded, mucronate or somewhat acute, or occasionally tripartite, $\frac{1}{4}$ to 1 in. long, $\frac{1}{16}$ to $\frac{1}{4}$ in. wide; dull greyish-green above, more or less glaucous beneath and conspicuously net-veined. *Flowers* bright golden-yellow, $\frac{3}{8}$ in. in diameter, in fascicles or shortly stalked umbels. *Sepals* 6, obovate-orbicular, $\frac{1}{12}$ to $\frac{1}{8}$ in. long. *Petals* 6, obovate, shorter than the sepals. *Stamens* shorter than the petals. *Berry* globose, $\frac{1}{4}$ in. in diameter, pale salmon-red on the sunny side, yellowish or whitish in the shade.

Fig. 1, leaf; 2, bud; 3, flower fully open; 4, petal; 5 and 6, stamens; 7, pistil:—*all enlarged.*

8415

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TAB. 8415.

DISA LUGENS.

South Africa.

ORCHIDACEAE. Tribe OPHRYDEAE.

DISA, *Berg.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 630.

Disa (Herschelia) lugens, *Bolus in Journ. Linn. Soc.* vol. xx. p. 483, *in Trans. S. Afr. Phil. Soc.* vol. v. p. 171 *et in Ic. Orch. Austr.-Afr.* vol. ii. t. 76; *N. E. Br. in Gard. Chron.* 1885, vol. xxiv. p. 232; *Schlecht. in Engl. Jahrb.* vol. xxxi. p. 288; affinis *D. barbatae*, Sw., sed labello amplo et viride, sepalo postico viridi-striato et sepalis lateralibus purpureis differt.

Herba terrestris, gracilis, 40–80 cm. alta. *Folia* radicalia, pauca, suberecta, elongato-linearia, graminifolia, subacuta, rigida, supra canaliculata, subtus carinata, 20–55 cm. longa. *Scapus* erectus, strictus vel flexuosus, 40–80 cm. altus, vaginis membranaceis arcte amplectentibus acuminatis distantibus vestitus. *Racemus* 10–20 cm. longus, laxe 5–15-florus. *Bracteae* ovato-lanceolatae, acuminatissimae, membranaceae, pedicellis multo breviores. *Pedicelli* 2–2·5 cm. longi. *Flores* patentes, mediocres. *Sepalum* posticum galeatum, late ovatum, apice acutum et recurvum, 1–1·4 cm. longum, pallide coeruleum, viridi-striatum; dorso in calcar conicum apice acuminatum et recurvum 6–8 mm. longum producto. *Sepala* lateralia patentia, oblongo-lanceolata, acuta, 1–1·4 cm. longa, purpurea. *Petala* resupinata, biloba, incurva, 6 mm. longa; lobo postico oblongo-lanceolato utrinque denticulato, lobo antico falcato-oblongo obtuso et integro. *Labellum* deflexum vel recurvum, oblongo-linguiforme, profunde lacerato-multifidum, 1·8–2·3 cm. longum, laciniis apicem versus saepe 2–4-lobis. *Columna* brevis; anthera valde resupinata; rostellum erectum, trifidum; stigma pulvinatum.—*D. barbata*, Lindl. Gen. et Sp. Orch. p. 354, partim; non Sw. *Herschelia lugens*, Kraenzl. Orch. Gen. et Sp. vol. i. p. 806.—R. A. ROLFE.

The interesting South African Orchid which forms the subject of our illustration is one of the "blue" Disas, which are sometimes looked upon as belonging to a distinct genus *Herschelia*, Lindl. According to the late Mr. Bolus, who first described the species in 1884, our subject is by far the tallest and strongest member of the *Herschelia* group which is here treated as a distinct section. This species was, prior to its differentiation by Dr. Bolus, confused with the nearly allied *D. barbata*, Sw., but is readily distinguished by the metallic greenish-purple hue of its flowers; those of *D. barbata* are white, lined with blue on the dorsal sepal. *D. lugens* grows on the Cape Flats, in moist sandy soil among *Restiaceae*, at an elevation of about 100 feet above sea level, and flowers there in the months of October and November. From this

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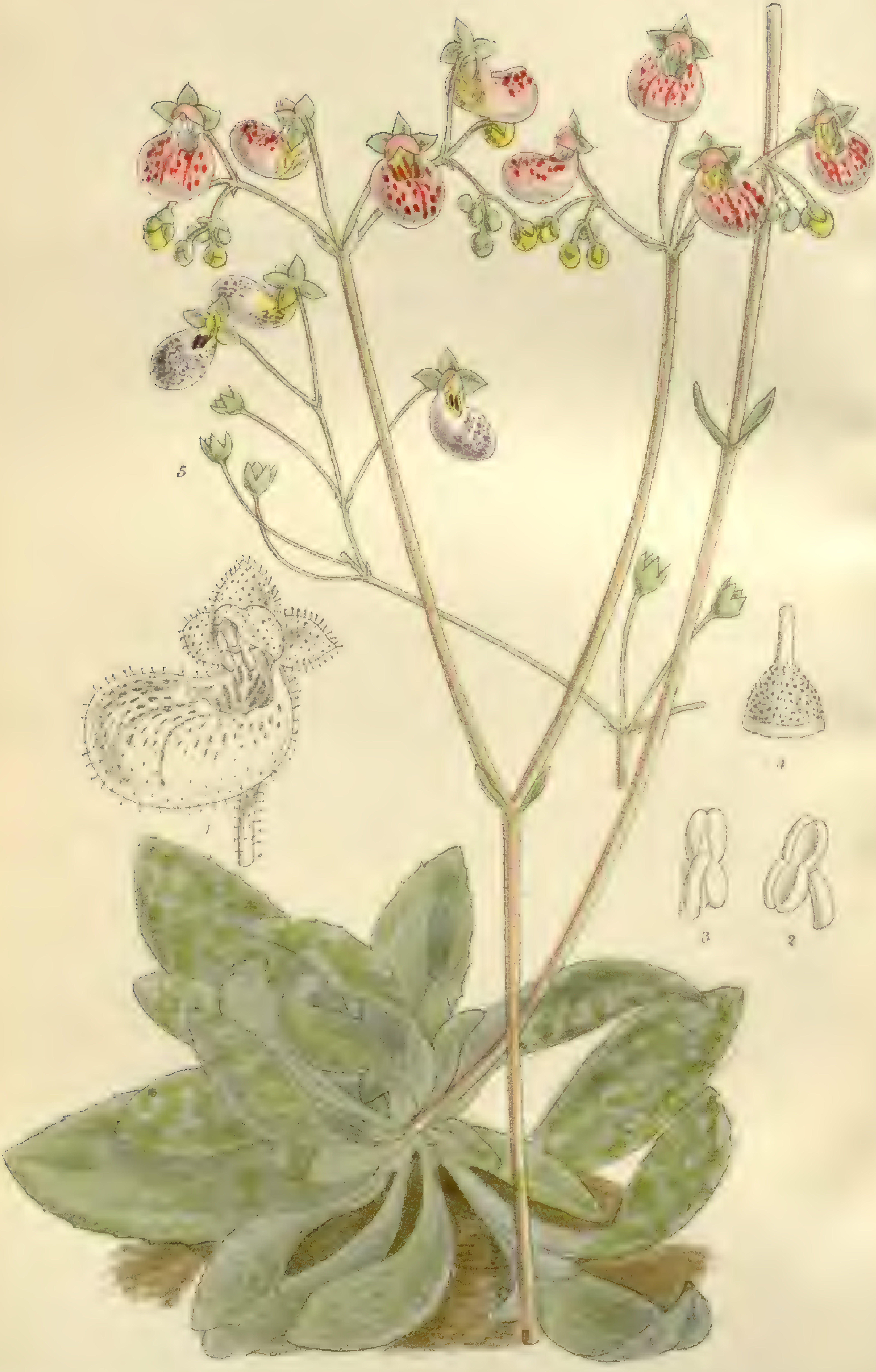
locality it extends eastward as far as Coldstream, near Grahamstown. Though the species has been repeatedly introduced to cultivation in this country, it is by no means easy to maintain in good condition, owing to its tendency to dwindle away after flowering. It thrives most satisfactorily when grown as a greenhouse-plant in a cool, airy, sunny position in a mixture of equal parts of sand, peat, loam and charcoal. The growth of the tubers commences in autumn, and when the plants have become well established and are in full growth they require an abundance of water at the root. After the flowers have appeared the plant commences to die down. The supply of water should then be gradually reduced until growth ceases. Then the tubers should be kept quite dry for a period of from two to three months.

DESCRIPTION.—*Herb*, terrestrial, slender, 1½–2 ft. high. *Leaves* few, radical, suberect, linear-elongate, grassy, rigid, subacute, channelled above and keeled on the under surface, 8–20 in. long. *Scape* erect, strict or flexuose, 1½–2 ft. long, clothed with membranous, closely clasping, distant, acuminate sheaths; racemes laxly 5–15-flowered, 4–8 in. long; bracts ovate-lanceolate, acuminate, membranous, much shorter than the pedicels; pedicels ¾–1 lin. long. *Flowers* spreading, of moderate size. *Sepals*: posterior pale blue with greenish stripes, galeate, wide ovate, with an acute recurved tip, and prolonged behind in a conical acute and recurved spur 3–4 lin. long; lateral purple, spreading, oblong-lanceolate, acute, 5–7 lin. long. *Petals* resupinate, 2-lobed, incurved, 3 lin. long; posterior lobe oblong-lanceolate, denticulate on each side, anterior falcate-oblong, obtuse, entire. *Lip* deflexed or recurved, narrowly oblong and deeply multifid-lacerate, ¾–1 in. long; segments often 2–4-lobed towards the tip. *Column* short; anther very resupinate; rostellum erect, 3-fid; stigma pulvinate.

Fig. 1, petal; 2, part of lip; 3, column; 4, pollinia:—*all enlarged.*

8416



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Tab. 8416.

CALCEOLARIA CANA.

Chile.

Scrophulariaceae. Tribe Calceolarieae.

Calceolaria, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 929; *Kraenzl. in Engl. Pflanzenr. Scroph.-Antirrh.-Calc.* p. 21.

Calceolaria cana, *Cav. Ic.* vol. v. p. 27, t. 443, fig. 2; *Benth. in DC. Prodr.* vol. x. p. 209; *Clos. in Gay, Fl. Chil.* vol. v. p. 182; *Kraenzl.* l.c. p. 48; affinis *C. arachnoideae*, Grah., sed planta tenuiore minuscule dense lanata, foliis caulinis multo minoribus et corollae colore differt.

Herba perennis, caespitosa, parvula, scaposa. *Folia* radicalia arcte conferta, oblongo-lanceolata, spathulata vel obovata, 3–6 cm. longa, 1·5–2·2 cm. lata, apice subacuta vel obtusa, basi in petiolum latum saepe brevem sensim angustata, integra vel denticulata, plus minusve dense albo-lanata. *Scapus* gracilis, erectus, inflorescentia inclusa 3–5 dm. altus, teres, parce pilosus vel glabrescens, apice saepe bifurcatus, foliis paucis lineari-oblongis 6–8 mm. longis instructus. *Inflorescentia* laxa, primo subcorymbiformis, more dichasii ramosa, demum ramulis racemiformibus 5–15 cm. longis praedita, plus minusve glanduloso-pubescens. *Pedicelli* gracillimi, 8–10 mm. longi. *Flores* odorati. *Calyx* circiter 4 mm. longus, glanduloso-pubescens, lobis subaequalibus ovatis circiter 2 mm. latis. *Corolla* albida cum maculis et lineis parvis rubris vel purpureis ornata, saepe plus minusve colore rubro vel purpureo suffusa, fauce lutea et maculis majoribus purpureo-brunneis notata; labium superum cucullatum, calyce subaequilongum; labium inferum ellipsoideo-globosum, 9–10 mm. longum, 6–8 mm. latum, orificio obovato, 4–5 mm. diametro. *Stamina* brevissima filamentis parce glanduloso-pubescentibus. *Ovarium* dense glanduloso-puberulum, calyce paulum brevius. *Capsula* late ovoidea, breviter rostrata, 4–5 mm. longa.—S. A. Skan.

In the most recent monograph of the genus *Calceolaria* Dr. Kraenzlin has recognised about two hundred species, all of them confined to the American continent, where they extend from Mexico through Central America to South America, and occur also in the Falkland Islands. In the case of the solitary Peruvian form with triandrous flowers, *C. triandra*, Vahl, the treatment proposed by G. Don has been followed and the plant is recognised as the type of a distinct genus *Porodittia*, G. Don; while the four New Zealand species, to which have to be added two from Chile and Peru, with ringent but not calceolate lips, have been placed by Kraenzlin in a distinct genus, *Jovellana.* With very few exceptions the species referable to the restricted

January, 1912.

genus *Calceolaria* are found only on the western side of the American continent. They are concentrated more especially in Peru and Chile, the number of species in Peru being about ninety-four, in Chile about seventy-five. Each country has fifty-eight species peculiar to itself; only nine species are common to both. The species which forms the subject of our plate is one of those peculiar to Chile, where it has been collected by Mr. H. J. Elwes as far south as the Baños de Chillan in Ñuble at 5–6,000 feet above sea level, and by Professor Philippi as far north as the province of Coquimbo. The plant from which our figure has been prepared is one of several raised from seed purchased in October, 1910, from Mr. J. D. Husbands, Limavida, Chile. Grown in a pot in a cool frame, it has formed suberect stems about four inches long, some of which have developed terminal erect slender scapes about a foot and a half in length that continued to bear flowers from June till October. The flowers, which are distinctly violet-scented, have hitherto been stated to be yellow, doubtless the result of descriptions based on dried specimens in which they soon become yellowish or brownish-white; they are, however, usually purple, less often rose coloured. The plant, which appears to be a perennial, might easily be mistaken, when not in flower, for a *Stachys* or a *Gnaphalium*. The nearest ally of *C. cana* is *C. arachnoidea*, Grah., figured at t. 2874 of this work; that species, however, differs from *C. cana* in being usually more robust and more woolly and in having much larger cauline leaves, with purple self-coloured flowers devoid of the markings which characterise those of *C. cana.*

Description.—*Herb*, perennial, tufted, rather small, scapose. *Leaves* radical, close set, oblong-lanceolate, spathulate or obovate, $1\frac{1}{4}$–$2\frac{1}{4}$ in. long, $\frac{2}{3}$–$\frac{3}{4}$ in. wide, subacute or obtuse, gradually narrowed to a broad often short petiole, entire or finely toothed, more or less densely white woolly. *Scape* slender, erect, including the inflorescence 1–$1\frac{1}{2}$ ft. long, cylindric, sparingly pilose or nearly glabrous, often bifurcate upwards, with a few small linear oblong leafy bracts, 3–4 lin. long. *Inflorescence* open, at first almost corymbose, cymosely branched, the branches ultimately elongated, raceme-like, 2–6 in. long, more or less glandular pubescent. *Pedicels* very slender, 4–5 lin.

long. *Flowers* violet-scented. *Calyx* about 2 lin. long, glandular-pubescent, lobes ovate, subequal, about 1 lin. wide. *Corolla* white, distinctly marked with small purple or rose-coloured blotches and lines, often more or less suffused throughout with rose or purple; throat yellow, with larger purplish-brown blotches; upper lip hooded, about as long as the calyx; lower lip ellipsoid-globose, about 5 lin. long, 3–4 lin. wide; mouth obovate, 2–2½ lin. across. *Stamens* very short; filaments sparingly glandular-pubescent. *Ovary* densely glandular puberulous, slightly shorter than the calyx. *Capsule* densely glandular-puberulous, shortly beaked, 2–2½ lin. long.

Fig. 1, flower; 2 and 3, stamens; 4, pistil; 5, portion of inflorescence from another plant:—*all enlarged except 5, which is of natural size.*

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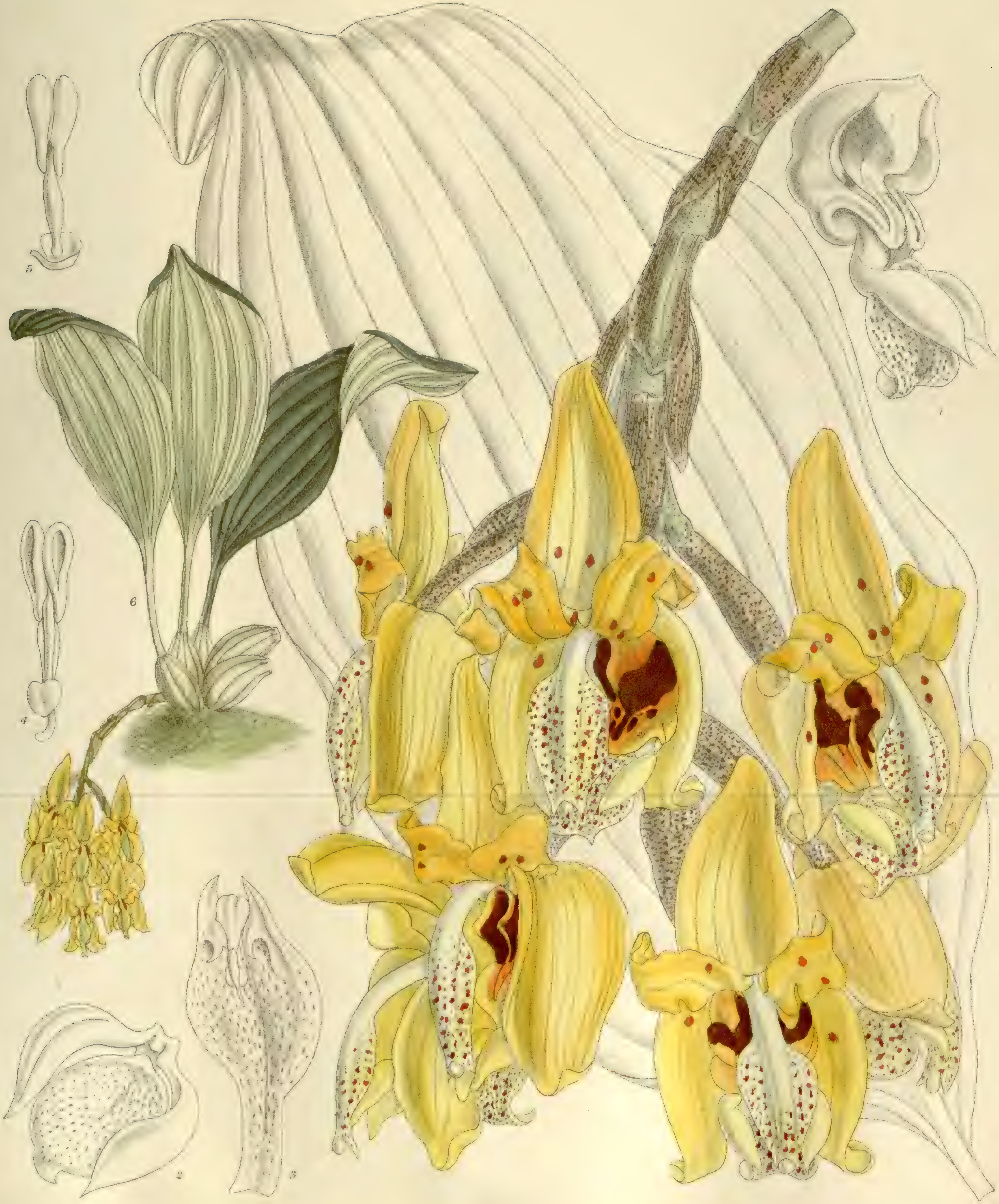

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TAB. 8417.

STANHOPEA PERUVIANA.

Peru.

ORCHIDACEAE. Tribe VANDEAE.

STANHOPEA, *Frost*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 549.

Stanhopea peruviana, *Rolfe*; species e grege *S. Wardii*, Lodd., floribus minoribus, petalis angustis, et labelli hypochilio valde abbreviato vel late oblongo lateribus obscure angulatis distincta.

Herba; pseudobulbi ovoideo-oblongi, obscure angulati, 4–6 cm. longi, monophylli. *Folia* petiolata, late elliptica, subobtusa, margine subundulata; limbus 25–35 cm. longus, 12–14 cm. latus; petiolus 6–7 cm. longus. *Scapi* penduli, circiter 25 cm. longi, vaginis ovato-oblongis subimbricatis vestiti, multiflori. *Bracteae* oblongae vel ovato-oblongae, subobtusae, valde concavae, 4–5 cm. longae. *Pedicelli* 5–6 cm. longi. *Flores* speciosi, aurei, labelli hypochilio lateribus atropurpureo-suffusis, epichilio punctulato, columna punctulata. *Sepalum* posticum oblongum, subobtusum, concavum, 4–5 cm. longum; sepala lateralia oblique et late ovata, obtusa, 4 cm. longa. *Petala* lineari-oblonga, subacuta, revoluta, 3·5 cm. longa. *Labellum* circiter 4 cm. longum; hypochilium subglobosum vel late oblongum, 2·5 cm. longum, 1·7 cm. latum, curvatum, lateribus carinatis, canali postice aperta; mesochilii cornu falcato-lanceolato, acuto, 2 cm. longo; epichilium orbiculari-ovatum, apice reflexum et apiculatum, circiter 1·5 cm. longum. *Columna* incurva, late alata, 3·5 cm. longa, 1·5 cm. lata.—R. A. ROLFE.

The handsome *Stanhopea* here figured was discovered in Peru by Mr. Forget when collecting on behalf of Messrs. Sander & Sons, St. Albans, to whom Kew is indebted for the plant which forms the basis of our plate. This plant was presented by them to the Kew collection in 1909, the year of its first importation. It has thriven well in the Cattleya House and flowered for the first time in January, 1910. It is allied to the Mexican *S. Wardii*, Lodd., but has smaller flowers with narrower petals, while the hypochile of the lip differs materially in shape and is not distinctly angled at the base. It may also be compared with *S. Shuttleworthii*, Reichb. f., but that species again has larger flowers, while the hypochile of the lip is broadly expanded at the base. *S. peruviana* is remarkable for the unusual width and almost board-like firmness of its dark-green, plicate leaves. As in most other species of the genus the flowers, which in *S. peruviana* are very fragrant, last for only a few days.

FEBRUARY, 1912.

DESCRIPTION.—*Herb*; pseudobulbs ovoid-oblong, obscurely angled, 1½–2¼ in. long. *Leaves* solitary to a pseudobulb, petioled, broadly elliptic, somewhat obtuse, margin slightly undulate; blade 10–14 in. long, 5–6½ in. across; petiole about 2½ in. long. *Scapes* pendulous, many-flowered, about 10 in. long, clothed with ovate-oblong slightly imbricate sheaths. *Bracts* oblong or ovate-oblong, somewhat obtuse, very concave, up to 2 in. long. *Pedicels* about 2 in. long. *Flowers* showy, golden-yellow, the hypochile of the lip suffused at the sides with dark purple, the epichile of the lip and the column spotted with dark purple. *Sepals*: posterior oblong, rather obtuse, concave, up to 2 in. in length; lateral obliquely and broadly ovate, obtuse, 1¾ in. long. *Petals* linear-oblong, subacute, revolute, 1½ in. long. *Lip* about 1¾ in. long; hypochile sub-globose or wide oblong, 1 in. long, ⅔ in. across, curved, the sides keeled, the channel open behind; horn of the mesochile falcate-lanceolate, acute, ¾ in. long; epichile orbicular-ovate, reflexed and apiculate at the tip, about ⅗ in. long. *Column* incurved, broadly winged, 1½ in. long, ⅗ in. across.

Fig. 1, lip; 2, horns of the mesochile and the epichile; 3, column; 4 and 5, pollinarium seen from in front and from behind; 6, sketch of an entire plant:—*all enlarged except 6, which is much reduced.*

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Tab. 8418.

STRANVAESIA UNDULATA.

China.

Rosaceae. Tribe Pomeae.

Stranvaesia, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 605.

Stranvaesia undulata, *Decne in Nouv. Arch. Mus. Paris*, vol. x. p. 178; *Schneid. Handb. d. Laubholzk.* vol. i. p. 713; affinis *S. Nussia*, Schneid. (Pyrus Nussia, *Ham. ex Don*; S. glaucescens, *Lindl.*), sed foliis semper integerrimis, corymbis minoribus minus floribundis, receptaculis sub anthesi nunquam albo-lanato-tomentosis distincta.

Frutex vel *arbor* in patria ad 9 m. alta, ramulis adpresse hirtis vetustis cortice plumbeo vel cinereo tectis. *Folia* lanceolata vel oblanceolata, in eadem planta valde variabilia, basi acuta vel subacuta, rarius obtusiuscula, apice acuta, breviter acute acuminata vel interdum obtusiuscula, integerrima, 3·5–10 cm. longa, 1·5–3·5 cm. lata, coriacea, viridia, infra pallidiora et plerumque ab initio glaberrima, supra in costa et ad margines primo pubescentia, saepe quasi lineis argenteis notata, deinde magis minusve glabrescentia, nervis utrinque 7–12; petioli 10–15 mm. longi, supra canaliculati et magis minusve—interdum dense—hirto-pubescentes; stipulae subulatae, 6–11 mm. longae, sub anthesi persistentes. *Corymbi* inferne saepe foliati, majores ad 5 cm. alti et 5–6 cm. diametro, densi vel laxiusculi, ramis pedicellisque magis minusve adpresse hirtis, rarissime fere glabris, hisce demum elongatis, ad 6 mm. longis. *Receptaculum* semigloboso-turbinatum, sub anthesi 2 mm. altum, laxe vel parce pubescens et superne plerumque glabrum. *Sepala* triangularia, paulo ultra 1 mm. longa, minute ciliolata. *Petala* alba, orbicularia, 3–4 mm. diametro, cito decidua. *Stamina* circiter 20, antheris rubris. *Ovarium* vertice tomentosum; stylus ad 4 mm. longus; stigmata capitata. *Fructus* aurantiaci, subdepresso-globosi, 6–7 mm. diametro.—O. Stapf.

The *Stranvaesia* which is here depicted, owing to the fleeting nature of its blossoms, for the petals fall as a rule in one or two days, does not possess much value as a flowering shrub. But as an ornamental-fruited evergreen it is exceedingly attractive, and as it is particularly hardy it is expected that in places with a cold winter climate, such as New England or Eastern Canada, it may make an efficient substitute on walls for the Pyracanth so much employed in this manner in Europe. The form here figured was introduced about 1900 by Mr. E. H. Wilson for Messrs. Veitch & Sons, from whom the plant was purchased. In England

February, 1912.

it can be grown as a shrub, and thrives well in loamy soil in a sunny situation. It can be increased either by cuttings or by seeds. *S. undulata*, to which our form is here referred by Dr. Stapf, is taken in the sense proposed by Schneider, and includes *S. Davidiana*, Decne, which in turn appears identical with *S. Henryi*, Diels. The characters which distinguish these Stranvaesias are somewhat slight. Though our numerous Chinese specimens can be assorted into two groups which approximately correspond to the *S. undulata* and *S. Davidiana* of Decaisne, these groups pass into each other. The plant figured is one of these intermediate forms, because its leaves are those of *S. undulata* as originally understood, while the inflorescences point to its being *S. Davidiana*. *S. integrifolia*, Stapf, from Kinabalu in Borneo, mainly differs from this Chinese species in having leaves with a smaller number of rather more prominent nerves.

DESCRIPTION.—*Shrub* or *tree*, reaching 30 ft. in height in Central China; twigs adpressed hairy; bark ultimately dark bluish-grey. *Leaves* lanceolate or oblanceolate, most variable on the same individual, acute or shortly sharply acuminate or even almost blunt, base wide or narrow acute, margin quite entire, 1½–4 in. long, ⅔–1½ in. across, coriaceous, green, paler and usually quite glabrous beneath, at first pubescent on the midrib and margins above, often marked as with silvery lines; nerves 7–12 on each side; petioles 5–8 lin. long, usually more or less hairy; stipules subulate, 3–5 lin. long, more or less persistent till flowering is past. *Corymbs* often leafy below, the larger 2 in. long and rather more across, dense or rather open, their rachises and pedicels more or less adpressed hairy, or occasionally almost glabrous; pedicels ultimately elongating, 3 lin. long. *Receptacle* hemispherical-turbinate, in flower 1 lin. deep, laxly and sparingly pubescent below, usually glabrous upwards. *Sepals* triangular, very short, minutely ciliolate. *Petals* white, orbicular, about 2 lin. across, soon falling. *Stamens* about 20, anthers red. *Ovary* tomentose above; style about 2 lin. long; stigmas capitate. *Fruit* orange, somewhat depressed-globose, 3–4 lin. in diameter.

Fig. 1, bud; 2, a flower in vertical section, the petals removed; 3 and 4, stamens; 5, pyrene:—*all enlarged.*

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Tab. 8419.

LEPTOSPERMUM SCOPARIUM, var. NICHOLLII.

New Zealand.

MYRTACEAE. Tribe LEPTOSPERMEAE.

LEPTOSPERMUM, *Forst.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 703.

Leptospermum scoparium, *Forst. Char. Gen.* p. 48, var. **Nichollii**; **a forma typica floribus carmineis solum differt.**

Frutex ad 3–5 m. altus, ramosissimus, ramis divaricatis primum sericeis cito glabrescentibus. *Folia* alterna, lanceolata, 8 mm. longa, 2 mm. lata, mucronata, breviter petiolata, rigida, obscure trinervia, punctata, viridia vel cuprea, juniores sparse pubescentia. *Flores* ad apices ramorum breviorum lateralium solitarii, circiter 1·5 cm. diametro. *Receptaculum* campanulatum, glabrum, minute punctatum. *Sepala* 5, ovata, obtusa, glabra, colorata. *Petala* 5, patentia, carminea. *Stamina* circiter 30, uniseriata, filamentis 2 mm. longis subulatis carmineis, antheris 0·5 mm. longis versatilibus longitudinaliter dehiscentibus. *Ovarium* inferum, superne convexum, 5-lobatum, 5-loculare; stylus 2 mm. longus stigmate terminali capitato. *Ovula* in quoque loculo numerosa, linearia, horizontalia.—*L. Nichollii*, Dorrien-Smith in Gard. Chron. 1908, vol. xliii. p. 398.—W. B. TURRILL.

For the introduction of the interesting *Leptospermum* now figured European gardens are indebted to Captain A. A. Dorrien-Smith, by whom it was brought to England from New Zealand in 1908. In the Gardeners' Chronicle for that year Captain Dorrien-Smith informs us that in New Zealand this plant is termed *L. Nichollii*, a name previously unknown in this country. It is stated that the plant was first found growing on sandhills to the north of Christchurch, and is believed in New Zealand to have originated as a seedling from a white-flowered plant discovered some years earlier in South Island, known there as *L. Chapmanii*, another name previously unknown in English collections. It is further said that the flowers of plants raised from seeds of this *L. Chapmanii* vary from bright rose to white, while their foliage varies from green to the colour of the leaves of the Copper Beech, *L. Nichollii* being one of the forms in which the leaves are of this latter colour. So far as this character is concerned it is found at Kew that the foliage is copper-coloured only in plants grown in the open; those grown under glass have the

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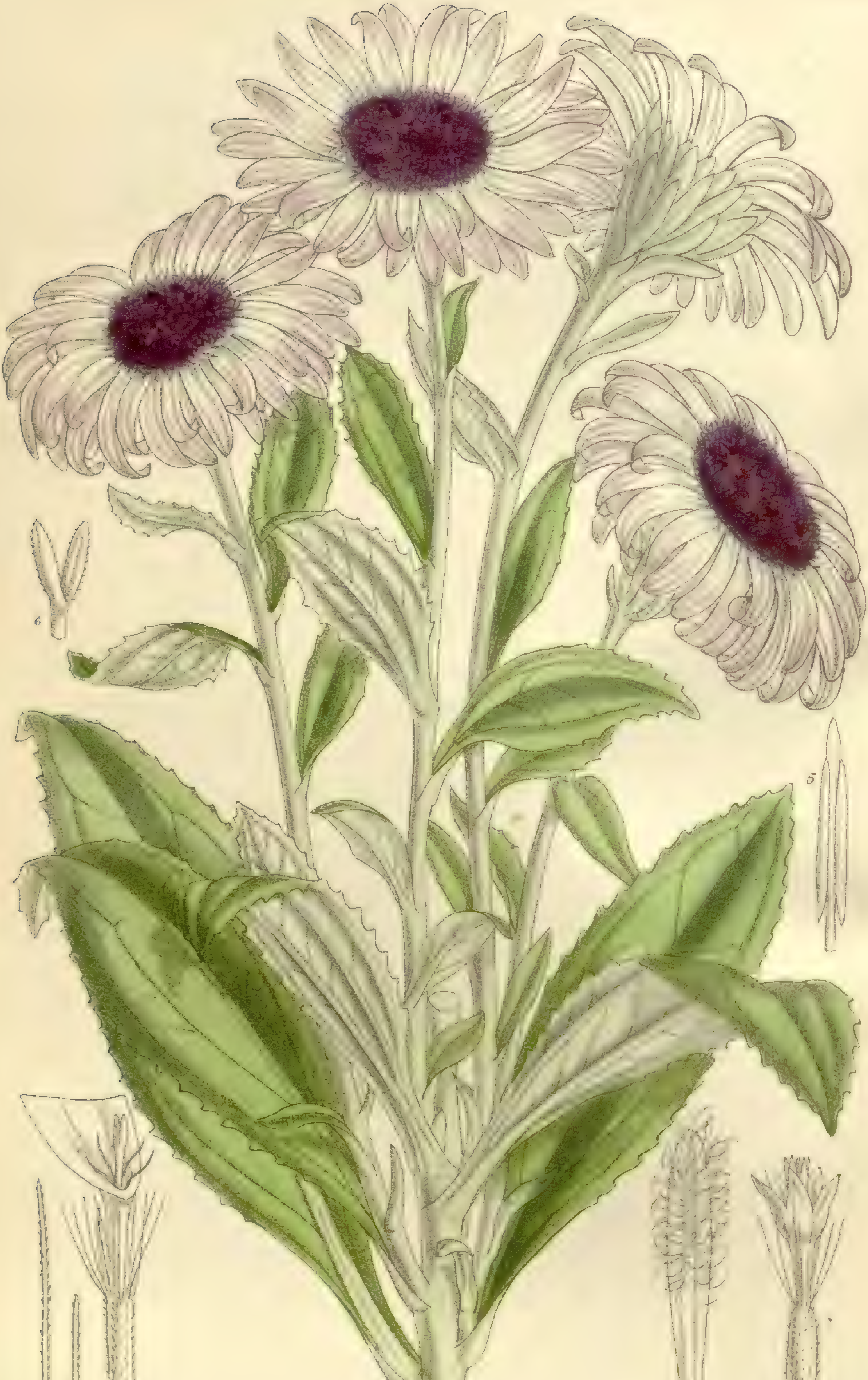
leaves green as shown in our illustration. The information available suggests that both *L. Chapmanii* and *L. Nichollii* may be no more than seedling forms of *L. scoparium*, a somewhat variable species widely distributed in Australia and New Zealand. In New Zealand botanical literature alone we find abundant testimony as to this variability; four distinguishable forms are recognised in Mr. Cheeseman's "Manual," three of which were first described in Sir J. D. Hooker's "Handbook," the fourth in Dr. Kirk's "Students' Flora." In this Magazine yet another variety, with pink flowers, has been described at t. 3419 as var. *grandiflora*; in the absence of more definite testimony it seems best for the moment to accord our plant similar treatment, as var. *Nichollii*, differing from the white-flowered type only in the brilliant carmine colour of the sepals, petals and filaments. Whatever its origin and status may be, *L. scoparium*, var. *Nichollii*, is a valuable addition to our gardens. It should command general favour since it is as hardy as *L. scoparium* itself, which is a common shrub in the open in the warmer parts of the United Kingdom and is hardy against a south wall at Kew. This variety is readily propagated from cuttings, and plants so raised flower when about a year old. The flowers open, in plants grown under glass, in April and last about six weeks.

DESCRIPTION.—*Shrub* reaching 10–18 ft. in height, much branched; branches divaricate, at first silky, soon almost glabrous. *Leaves* alternate, lanceolate, 4 lin. long, 1 lin. across, mucronate, short petioled, rigid, faintly 3-nerved, punctate, green or copper-coloured, sparingly pubescent when young. *Flowers* solitary at the tips of rather short lateral twigs, about $\frac{2}{3}$ in. across. *Receptacle* campanulate, glabrous, finely punctate. *Sepals* 5, ovate, obtuse, glabrous, coloured. *Petals* 5, spreading, carmine. *Stamens* about 30, 1-seriate; filaments 1 lin. long, subulate, carmine; anthers very short, versatile, opening longitudinally. *Ovary* inferior, convex above, 5-lobed and 5-celled; style 1 lin. long; stigma terminal capitate. *Ovules* many in each cell, linear, horizontal.

Fig. 1, leaves; 2, bud; 3, a flower, the petals removed; 4 and 5, stamens:—*all enlarged.*



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TAB. 8420.

OLEARIA CHATHAMICA.

Chatham Islands.

COMPOSITAE. Tribe ASTEROIDEAE.

OLEARIA, *Moench.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 276.

Olearia chathamica, *T. Kirk in Trans. New Zeal. Inst.* vol. xxiii. p. 444; *Kirk, Students' Flora*, p. 264; *Cheeseman, Man. New Zeal. Flora*, p. 280; *Dorrien-Smith in Journ. Roy. Hort. Soc.* vol. xxxvii. p. 61; affinis *O. operinae*, Hook. f., sed foliis latioribus pedunculis longioribus bracteisque paucis foliaceis differt.

Frutex robustus, 1–2 m. altus; rami robusti, longitudinaliter sulcati, molliter albido-tomentosi. *Folia* alterna, oblanceolata vel oblongo-lanceolata, subacuta vel breviter acuminata, basi in petiolum brevem latum attenuata, 6–12 cm. longa, 1·5–3·5 cm. lata, crassa, rigide coriacea, serrata, dentibus obtusis callosis, supra glabra, reticulata, viridia, subtus dense-albido-lanata, nervis lateralibus utrinque 2–3 supra impressis subtus leviter elevatis. *Capitula* pedunculata, 5–6 cm. diametro, pedunculo lanato bracteis foliaceis instructo. *Involucri bracteae* lineares vel oblanceolato-lineares, acutae vel subacutae, ad 1 cm. longae, scariosae, extra superne lanatae, intus glabrae. *Flores radii* numerosi, pallido-violacei. *Corollae* tubus 4 mm. longus, parce puberulus; limbus oblongo-linearis, subacutus, circiter 1·5 cm. longus, 3–4 mm. latus, integer, glaber. *Flores disci* purpurei. *Corollae* tubus cylindricus, superne dilatatus, 4 mm. longus; lobi lanceolati, subacuti. *Antherae* 2 mm. longae. *Stylus* glaber; rami subacuti, 1·5 mm. longi. *Achaenia* basi attenuata, sulcata, 0·5 cm. longa, puberula. *Pappus* uniseriatus, setosus; setae inaequales, ad 4 mm. longae.—*O. operina*, Hook. f. Handb. New Zeal. Flora, p. 731, partim. *O. angustifolia*, var., Buchanan in Trans. New Zeal. Inst. vol. vii. p. 336, t. 15.—J. HUTCHINSON.

The handsome *Olearia* which forms the subject of our illustration is confined to the Chatham Islands, east of New Zealand, where, according to Captain Dorrien-Smith, who has given an account of the plant in the passage quoted above, it grows in compact masses on the cliff edges or scattered about among the upland bogs in association with *O. semidentata*, Decne, a species which, according to Dorrien-Smith, is even finer than *O. chathamica.* In its native habitat the plant is in flower during the months from November till February, each plant blooming for a prolonged period. Both Mr. Cheeseman and Captain Dorrien-Smith state that the ray-florets may at times be white; the disk-florets are violet-purple. The nearest ally of the species in the genus *Olearia* is *O. operina*,

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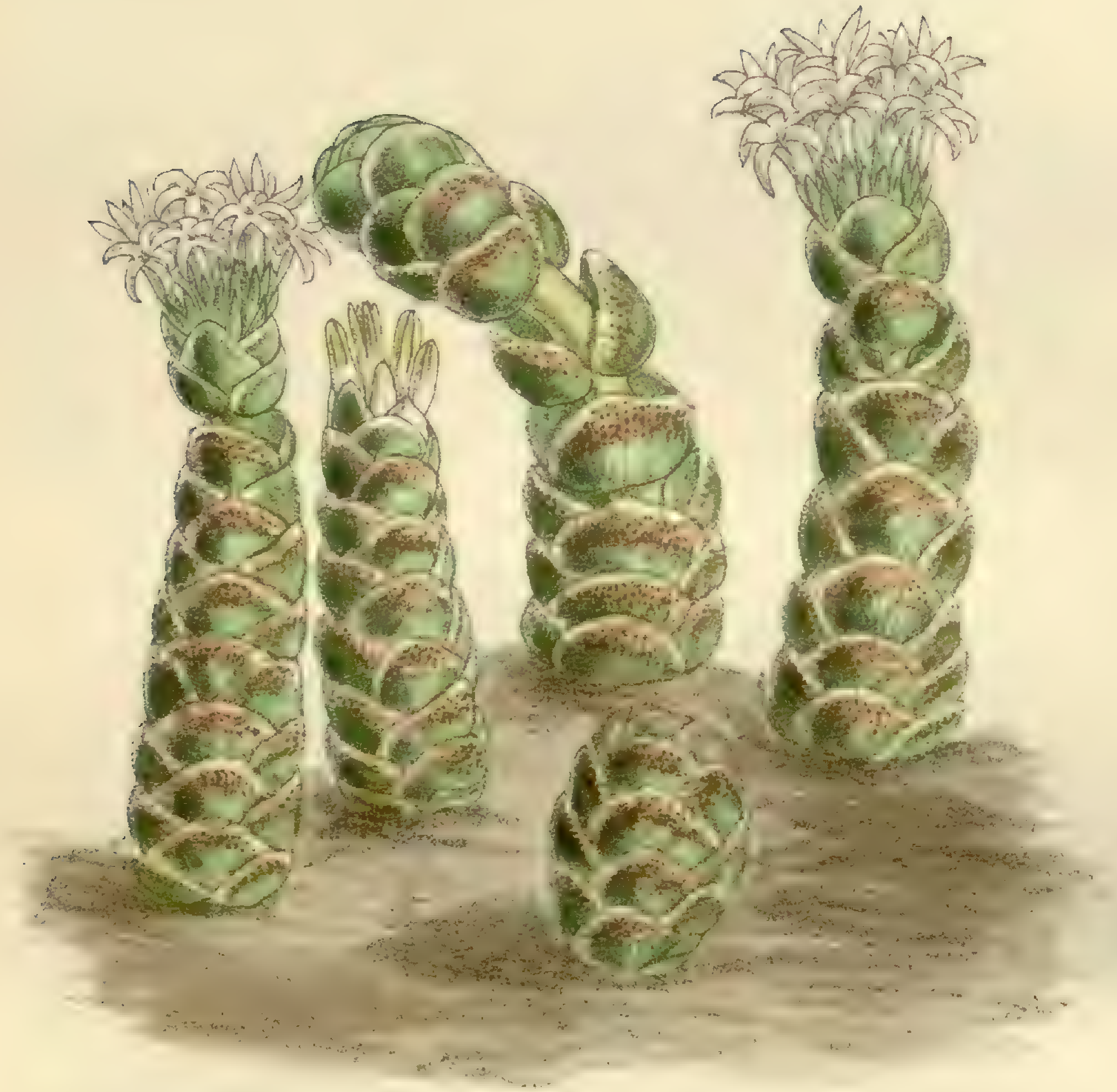
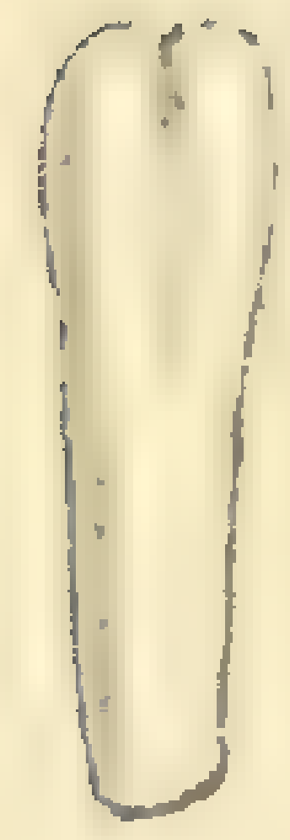
Hook. f., a native of New Zealand, from which our plant may be most readily distinguished by its broader leaves, and by its longer peduncles with fewer and more leafy bracts. For the material on which our figure is based we are indebted to the kindness of the Rev. A. T. Boscawen, in whose garden at Ludgvan Rectory, near Marazion, a plant imported by Captain Dorrien-Smith in 1908 flowered in June, 1911. The species, Mr. Boscawen informs us, has so far proved quite hardy at Ludgvan. It prefers a position sheltered from the mid-day sun, and seems to thrive best in a mixture of bog-earth, leaf-mould and grit. It is easily propagated by means of cuttings, which readily strike in the open without any protection.

DESCRIPTION.—*Shrub*, 3–7 ft. high; stems stout, branches stout, sulcate, softly white-tomentose. *Leaves* alternate, oblanceolate or oblong-lanceolate, subacute or shortly acuminate, narrowed below to a short broad petiole, 2½–5 in. long, ¾–1½ in. wide, thick, firmly leathery, serrate with blunt thickened teeth, glabrous, reticulate and green above, densely white-woolly beneath, main nerves 2–3 on each side of the midrib and like it impressed above, slightly raised beneath. *Heads* peduncled, 2–2¼ in. wide; peduncle woolly with a few leafy bracts. *Bracts* of the involucre linear or oblanceolate-linear, acute or subacute, 4–5 lin. long, scarious, woolly towards the apex outside, glabrous within. *Ray-florets* many, usually pale violet-purple, occasionally in wild plants white; corolla-tube 2 lin. long, sparingly puberulous, limb oblong-linear, subacute, 7–8 lin. long, about 2 lin. wide, entire, glabrous. *Disk-florets* violet-purple; corolla-tube cylindric, dilated upwards, 2 lin. long; lobes lanceolate, subacute. *Anthers* 1 lin. long. *Style* glabrous; its arms subacute, under 1 lin. long. *Fruit* narrowed to the base, sulcate, 2½ lin. long, puberulous. *Pappus* 1-seriate, setose; setae unequal, the longest 2 lin. long.

Fig. 1, bract of the involucre; 2, part of a ray-floret; 3, setae of the pappus; 4, disk-floret; 5, anther; 6 style-branches:—*all enlarged.*





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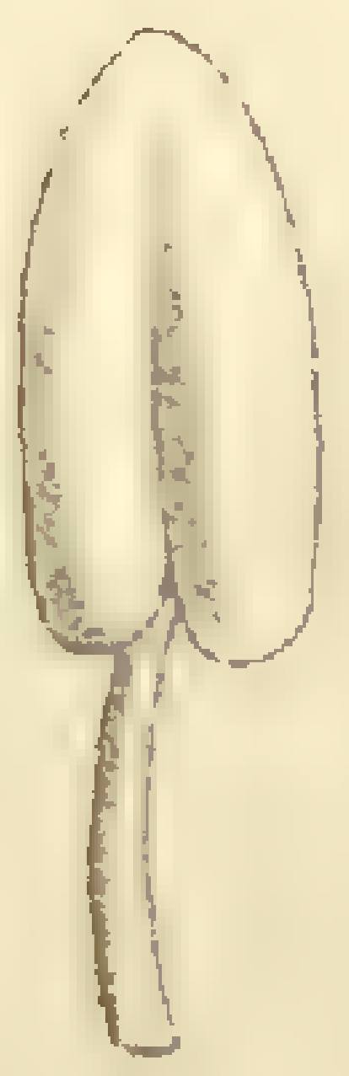

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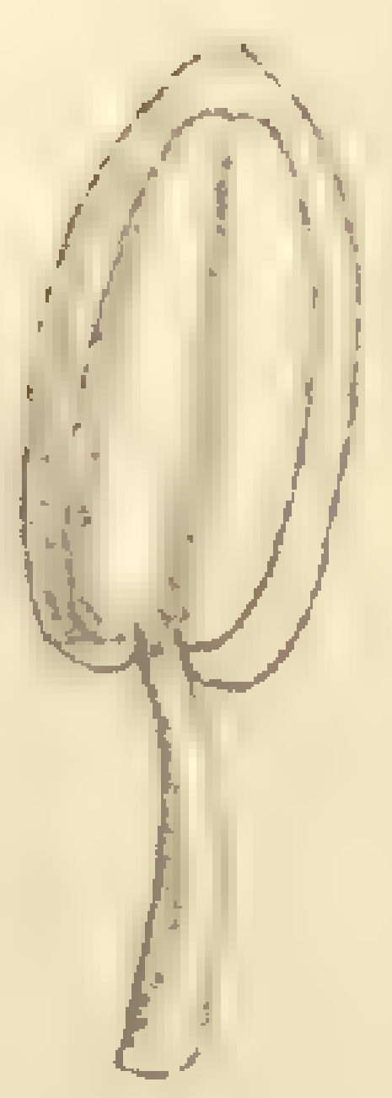

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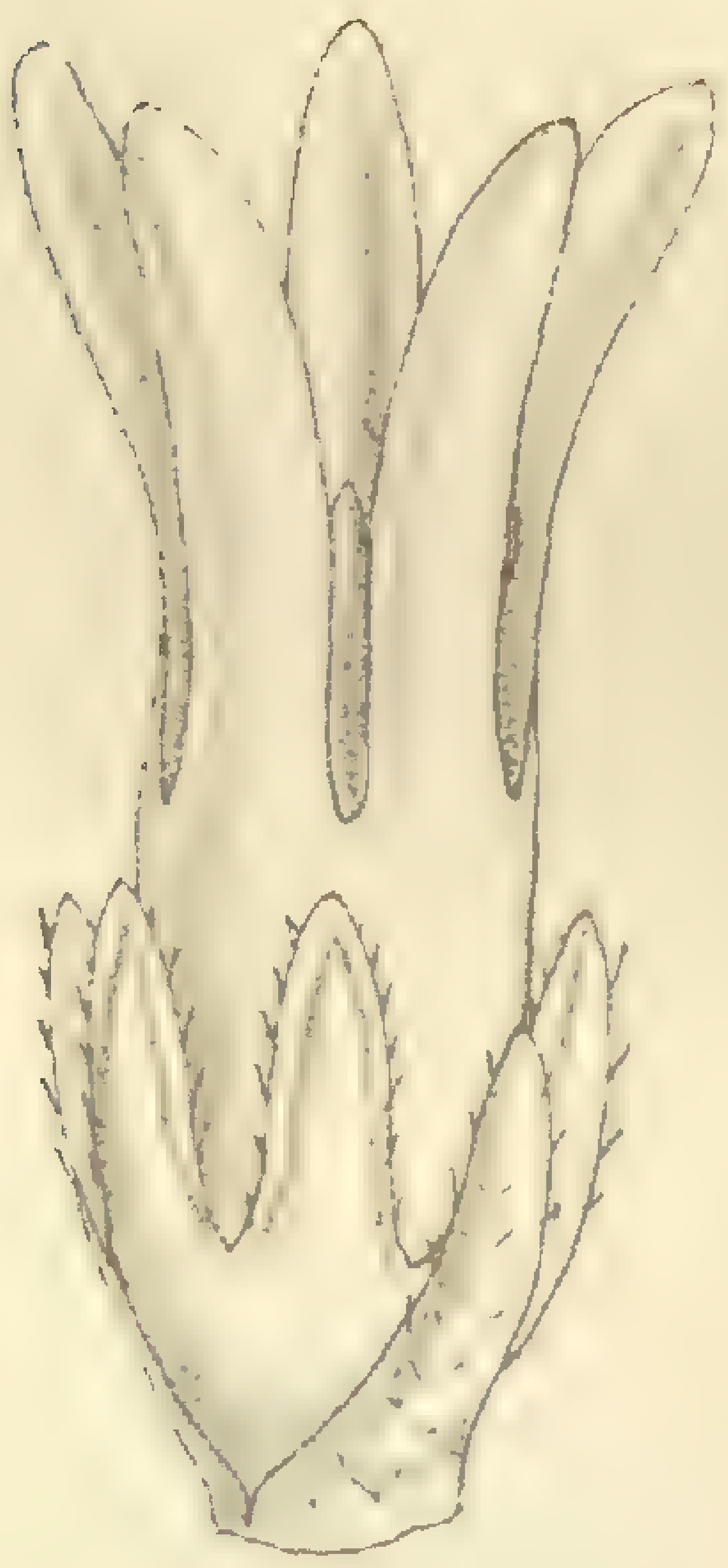

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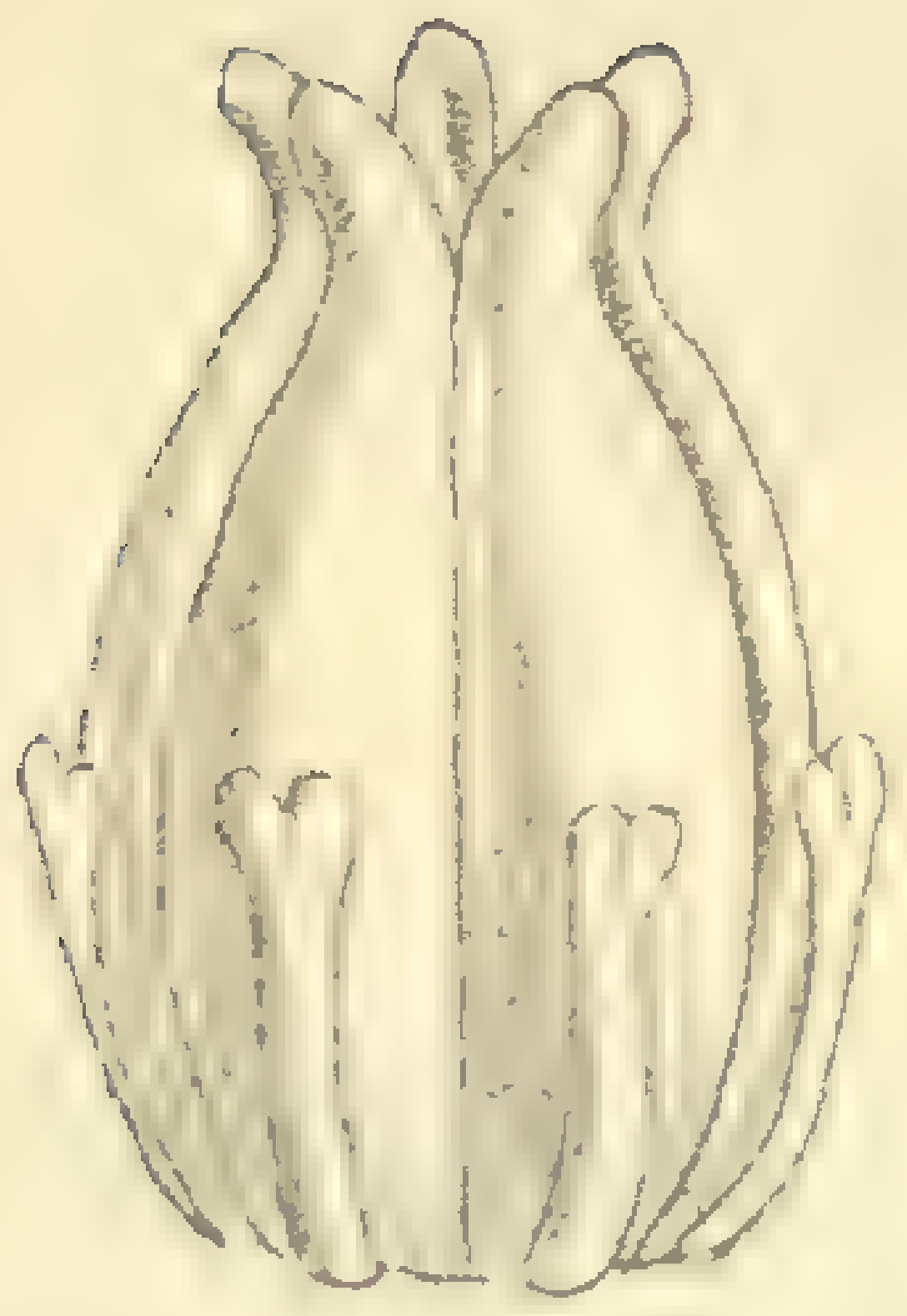

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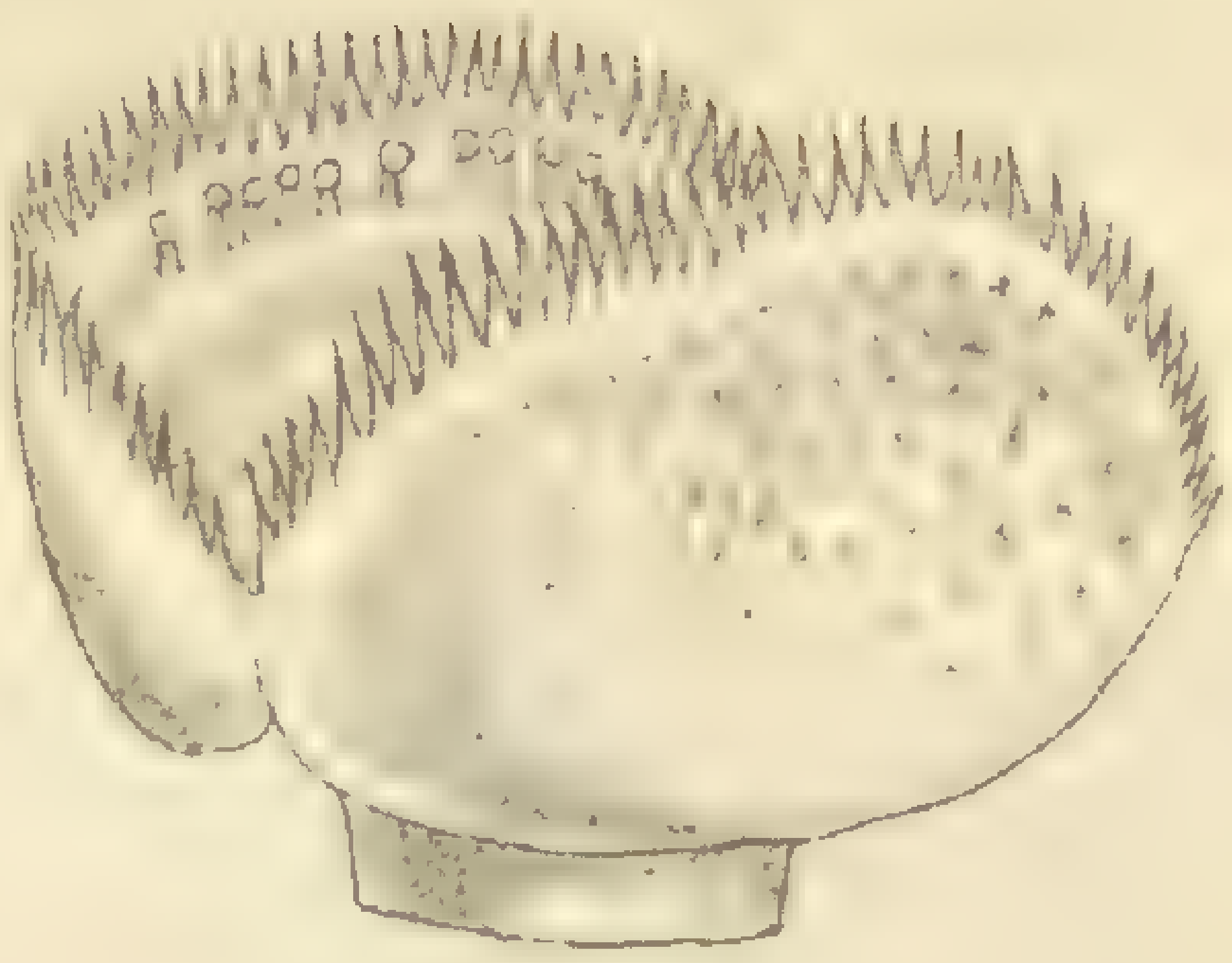

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TAB. 8421.

CRASSULA BARKLYI.

South Africa.

CRASSULACEAE.

CRASSULA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 657.

Crassula Barklyi, *N. E. Brown in Kew Bulletin*, 1906, p. 19; affinis *C. columnari*, Linn. f., sed minor et foliis tenuioribus ciliatis suberectis differt.

Herba succulenta. *Caulis* 2·5–5 cm. altus, simplex vel basi ramosus, cum foliis basi 1·2–1·8 cm. crassus, superne leviter attenuatus, obtuse tetragonus. *Folia* opposita, decussata, arcte imbricata, suberecta, basi connata, transverse elliptico-oblonga vel late lunata, obtusissima, dorso convexa, carnosa, marginibus acutis ciliolata, brunnea, punctata, inferiora 0·5–0·6 cm. longa, 1·2–1·3 cm. lata, superiora gradatim minora. *Flores* terminales, dense capitati, subsessiles. *Sepala* lineari-spathulata, obtusa, glabra, minute ciliata, 3 mm. longa. *Corolla* gamopetala, profunde 5-loba, glabra, alba (rubro-tincta?); tubus 2–2·5 mm. longus; lobi 6–7 mm. longi, lineares, obtusi, apice recurvo-patuli. *Stamina* 5, inclusa, ore tubi inserta; filamenta 1 mm. longa; antherae 1 mm. longae, oblongae. *Squamae hypogynae* 1 mm. longae, erectae, lineari-cuneatae, truncatae vel emarginatae, canaliculatae. *Carpella* 5, basi connata, erecta, stricta, subteretia, superne vix angustata.—N. E. BROWN.

The somewhat peculiar *Crassula* here figured was originally discovered in Little Namaqualand by the late Sir Henry Barkly, who communicated it to Kew in 1875. The plants here figured were received at Kew from Professor H. H. W. Pearson, of Cape Town, in January, 1911; they formed part of a collection made during the Percy Sladen Expedition, and were found by Mr. Pillans, a member of the party, on a ridge four miles to the south-east of Bakhuis. Grown in a house devoted to succulent plants, these specimens flowered in March, 1911. While under these conditions the flowers produced have been white, there is reason to think that when fully exposed to sun and air in their native habitat the petals assume a reddish tinge. The stems too, as compared with those of the specimens collected by Barkly, are unusually long; the original ones are only 1–1¼ inches high. Like other species of *Crassula* with a compact pyramidal habit, *C. Barklyi* is of slow growth and is prone, after flowering, to lose its vigour. The requirements of this and its nearer allies are best met

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by supplying dry tropical conditions and a sandy soil. Of these allies the most nearly related appears to be *C. columnaris*, Linn. f., from which, however, *C. Barklyi* is readily distinguished by the characters mentioned by Mr. Brown.

DESCRIPTION.—*Herb*, succulent; stem 1–2 in. in height, simple or branching at the base, including the leaves ½–⅔ in. thick at the base, slightly narrowing upwards and bluntly 4-angled throughout. *Leaves* opposite, decussate, closely imbricate, almost erect, connate at the base, the lower 2–3 lin. long, 6–7 lin. wide, gradually diminishing upwards. *Flowers* terminal, densely capitate, nearly sessile. *Sepals* linear-spathulate, obtuse, with finely ciliate margins but elsewhere glabrous. *Corolla* gamopetalous, deeply 5-lobed, glabrous, in cultivated specimens white; tube about 1 lin. long; lobes 3 lin. long or longer, linear, obtuse, with recurved spreading tips. *Stamens* 5, included, attached to the mouth of the tube; filaments and oblong anthers both very short. *Hypogynous scales* very short, erect, linear-cuneate, truncate or emarginate, channelled. *Carpels* 5, connate below, erect, strict, almost terete, hardly narrowed upwards.

Fig. 1, a pair of leaves; 2, a flower; 3 and 4, stamens; 5, carpels and hypogynous scales; 6, a single hypogynous scale:—*all enlarged.*

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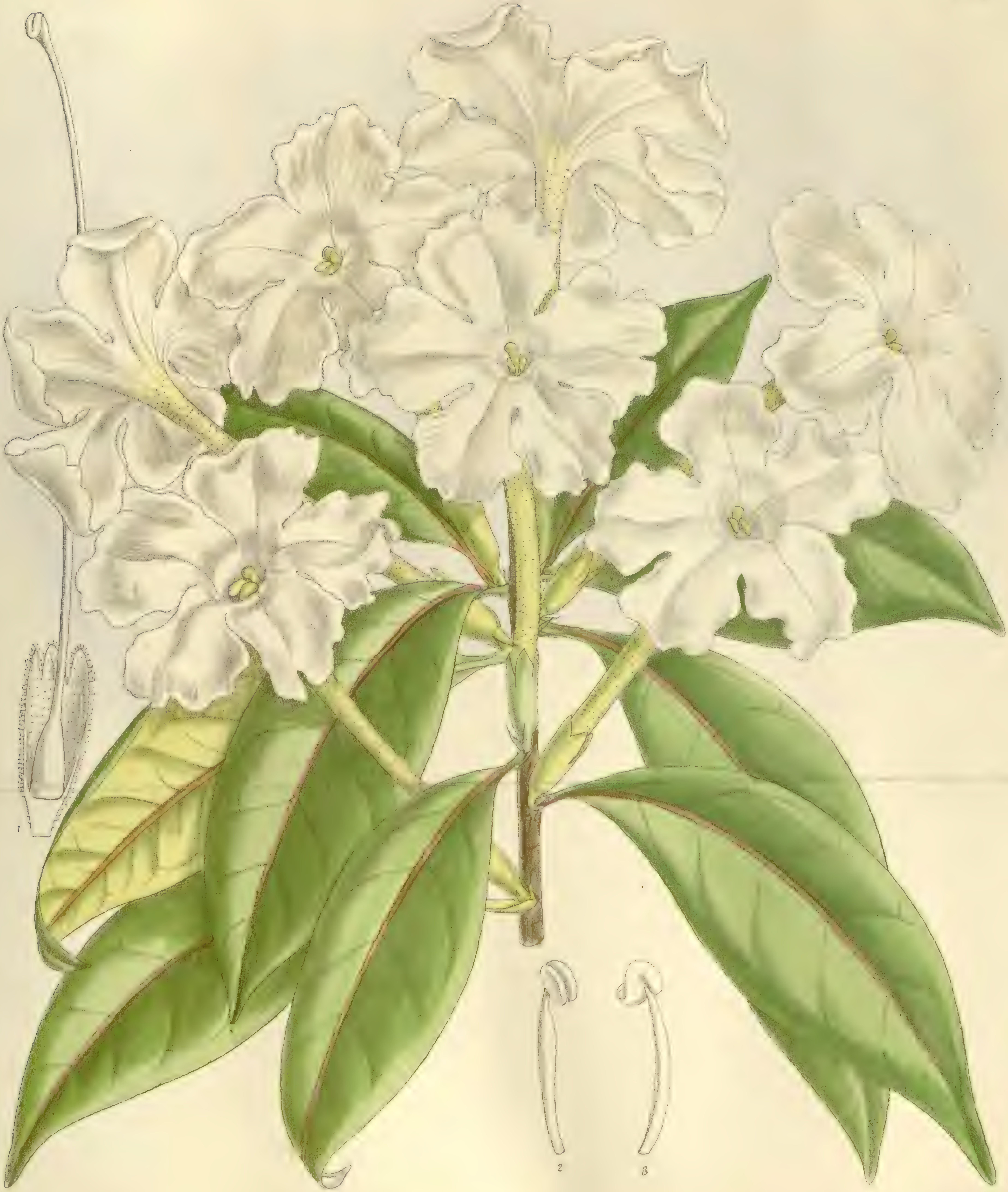

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TAB. 8422.

BRUNFELSIA UNDULATA.

West Indies.

SOLANACEAE. Tribe SALPIGLOSSIDAE.

BRUNFELSIA, *Sw.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 911.

Brunfelsia undulata, *Sw. Prodr. Veg. Ind. Occ.* p. 90 *et Fl. Ind. Occ.* vol. ii. p. 1035; *Bot. Reg.* t. 228; *Benth. in DC. Prodr.* vol. x. p. 200, *partim*; *Urban, Symb. Antill.* vol. iii. p. 374; species *B. americanae,* Linn., affinis, corollae lobis undulatis fructuque subdrupaceo differt.

Frutex vel *arbor* parva, usque ad 6 m. alta: caulis debilis. *Folia* ovato-lanceolata, utrinque attenuata, subacuta, integerrima, 6–18 cm. longa, 2–4·5 cm. lata, glabra; venae tenues, dense reticulatae; petiolus 6 mm. longus. *Flores* solitares, terminales vel in axillis foliorum summorum dispositi, breviter pedunculati. *Calyx* 2 cm. longus, breviter irregulariterque lobatus, extra glanduloso-pubescens; lobi obtusi. *Corolla* alba (an semper?); tubus cylindricus, leviter curvatus, 8–9 cm. longus, 5 mm. diametro, extra pubescens; limbus patens, 6–7 cm. diametro; lobi 5, rotundati, 2·5 cm. lati, marginibus undulatis. *Stamina* corollae tubo aequilonga. *Ovarium* oblongum, calyce dimidio brevius; stylus cylindricus, e corollae tubo paullo exsertus; stigma bilobum. *Fructus* subdrupaceus.—*B. nitida,* var. *jamaicensis,* Benth. in DC. Prodr. vol. x. p. 201. *B. jamaicensis,* Griseb. Fl. Brit. W. Ind. p. 432, partim.

The *Brunfelsia* which forms the subject of our illustration was first introduced to this country from Jamaica about a century ago, but the plant which supplied the material for the present figure is one obtained in 1904 for the Kew collection from Messrs. J. Veitch & Sons. This plant flowered at Kew in October, 1909. It is a vigorous shrub of upright habit and, as the plate shows, bore numerous flowers in the axils of the uppermost leaves so as to form large clusters at the ends of the branches. In wild specimens, however, it is usual to find but one terminal flower. This species belongs to that section of the genus wherein the corolla tube is many times longer than the calyx. Within this section the various species are difficult to discriminate. In one of them, *B. nitida*, Benth., the calyx is divided nearly to the base; this character is also exhibited by the plant which was figured in the Botanical Register, at t. 167, under the erroneous name *B. undulata.* In *B. americana*, Sw., however, and in the true *B. undulata*,

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Sw., which is here depicted, the calyx is cup-shaped and has very short obtuse lobes. While, however, the two are closely allied, *B. americana* can be readily recognised by its obtuse leaves, whereas those of our plant taper to both ends. It is a matter for observation as to whether the colour of the corolla varies in this species, because in Loddiges' Botanical Cabinet, at t. 388, and in Reichenbach's Flora Exotica, at t. 294, are given figures, under the name *B. undulata*, of a plant with a yellowish corolla. Under cultivation *B. undulata* thrives in a warm house when planted in loamy soil and liberally watered. It ought to prove a useful shrub in tropical gardens, for it appears to thrive in the open even in the south of Europe, and plants have been raised at Kew from seeds which ripened in 1888 in the Botanic Garden at Palermo. There is reason to believe that it is represented in various private collections in this country, sometimes under the erroneous name of *Portlandia grandiflora*, Linn., also a West Indian plant which is, however, readily distinguished, without taking into account other characters, by the fact that its leaves are opposite.

DESCRIPTION.—*Shrub*, or, in a wild state, a small tree reaching 20 ft. in height, with a comparatively slender stem. *Leaves* ovate-lanceolate, narrowed to both ends, subacute, quite entire, 2¼–7 in. long, ¾–1¾ in. wide, glabrous; nerves slender, closely reticulate; petiole ¼ in. long. *Flowers* usually in wild plants solitary, terminal; often in cultivated plants several in the upper axils forming terminal clusters; peduncles very short. *Calyx* ¾ in. long, shortly irregularly lobed, glandular pubescent externally; lobes obtuse. *Corolla* white or apparently at times yellowish; tube cylindric, slightly curved, 3–3½ in. long, ⅕ in. in diameter, pubescent externally; limb spreading, 2½ in. across; lobes 5, rounded, 1 in. wide, their margins undulate. *Stamens* as long as the corolla tube. *Ovary* oblong, half as long as the calyx; style cylindric, slightly exserted; stigma 2-lobed. *Fruit* subdrupaceous.

Fig. 1, calyx, in vertical section, and pistil; 2 and 3, stamens:—*all enlarged.*

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TAB. 8423.

SYRINGA JULIANAE.

China.

OLEACEAE. Tribe SYRINGEAE.

SYRINGA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 675.

Syringa Julianae, *C. Schneider in Ill. Handb. Laubholzk.* vol. ii. p. 777, fig. 488 v–x, *et in Kew Bull.* 1912, p. 37; affinis *S. pubescentis*, Turcz., sed differt foliis ramulorum floriferorum minoribus etiam supra pilosis brevius petiolatis, floribus minoribus, antheris paulo sub faucem corollae insertis, fructibus ut videtur non verrucosis.

Frutex ut videtur breve denseque ramosus, ramulis annotinis hornotinisque satis pubescentibus deinde glabris nigrescentibus. *Folia* ovato-elliptica, utrinque acuta, integerrima, viridia, breve pubescentia, subtus pallidiora, distinctius praecipue ad nervos pubescentia, 2·5–4·3 cm. longa, 1–2·3 cm. lata; petioli 2–5 mm. longi, puberuli. *Inflorescentiae* terminales, cymosae, parvae, ad 6 cm. longae, ramulis et pedicellis brevissimis subhirsutis. *Flores* albo-violacei, 6–7 mm. longi, bracteis linearibus calyce brevioribus caducis suffulti. *Calyx* violaceus, glaber, dentibus satis distinctis, late triangularibus acutis. *Antherae* violaceae, in sicco nigricantes, paulo sub faucem corollae insertae. *Fructus* maturi ignoti, immaturi ut videtur haud vel vix verrucosi.—C. K. SCHNEIDER.

The interesting Lilac here figured is a Chinese species nearly allied to the well-known *Syringa pubescens*, Turcz., a native of northern China and south-eastern Mongolia. The two together form the group recognised by Dr. Schneider as the *Pubescentes*, which belongs to the section *Vulgares* wherein are included such familiarly known garden shrubs as *S. vulgaris*, Linn., *S. oblata*, Lindl., *S. persica*, Linn., and *S. chinensis*, Willd. The species now described by Dr. Schneider as *S. Julianae* is one that was raised by Messrs. J. Veitch & Sons in the nursery at Coombe Wood from seeds sent from Western China by Mr. E. H. Wilson in 1901. The plant which supplied the material for our plate was obtained from Messrs. Veitch in 1909 under the name *S. villosa.* Owing to the too curtailed description of *S. villosa* originally provided by Vahl there has been some dubiety as to the identity of his plant. An examination of his type specimen has, however, established the fact that the plant figured at t. 8292 of this work as *S. Bretschneideri*, Lemoine, is really *S. villosa*, Vahl, and that the Lilac figured at t. 7064 under

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S. villosa is really *S. pubescens*, Turcz., the nearest ally of our plant. *S. Julianae* is, however, very distinct from *S. pubescens* in its villous leaves, branchlets and inflorescence; *S. velutina*, Komarov, which also resembles our plant, is readily distinguished by its different calyx. *S. Julianae* as grown at Kew is at present a small shrub 3 to 4 feet in height, bushy and virgately branched; it promises to attain a considerably larger size. It flowers in late May and in June, and although it is not likely to become a rival in gardens of the fine Lilacs now in cultivation, it is worth a place as a pretty and unusual type of the genus *Syringa*. The blossoms have the characteristic fragrance of the Common Lilac, but are strikingly distinct from those of other cultivated species in the deep purplish lilac colour of the corolla-tube outside as contrasted with the nearly white corolla-segments inside, and in the purple peduncle and pedicels. The glabrous calyx is purplish-violet. The species should be grown in rich, moist, loamy soil, and can be propagated by cuttings of moderately firm young wood placed in gentle heat in July.

Description.—*Shrub*, 3–4 ft. high or higher, shortly and densely branched, twigs of the present and of last season's growth rather pubescent, at length becoming glabrous and blackish. *Leaves* ovate-elliptic, acute and cuneate, quite entire, green, shortly pubescent, beneath rather pale and rather markedly pubescent especially on the nerves, 1–$1\frac{3}{4}$ in. long, $\frac{1}{3}$–1 in. wide; petioles under $\frac{1}{4}$ in. long, puberulous. *Inflorescences* terminal, cymose, small, rather more than 2 in. in length, branches and pedicels very short, slightly hairy. *Flowers* white and lilac-purple, 3–4 lin. long; bracts linear, shorter than the calyx, caducous. *Calyx* violet, glabrous; teeth rather distinct, wide-triangular, acute. *Anthers* violet, inserted a little below the corolla-throat. *Fruit* not known ripe, when young not verrucose.

Fig. 1, portion of the edge of a leaf; 2, flower; 3, corolla, laid open; 4 and 5, anthers; 6, pistil:—*all enlarged.*

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TAB. 8424.

DOMBEYA CALANTHA.

British Central Africa.

STERCULIACEAE. Tribe DOMBEYEAE.

DOMBEYA, *Cav.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 221.

Dombeya calantha, *K. Schum. in Engl. Monogr. Afr. Pfl.* vol. v. 1900, p. 28; species cymis longipedunculatis instar corymborum, floribus iis *Malvae moschatae*, Linn., similibus, ovarii loculis intus dense stellato-pilosis, 6–8-ovulatis distincta.

Planta erecta, fruticosa, 5·5 m. alta. *Caulis* subsimplex, 2 cm. diametro, brunneo-velutinus, inferne cicatricibus foliorum conspicuis notatus. *Rami* laterales pauci, breves, folia minuscula indivisa et tricuspidata gerentes. *Folia* triloba vel subquinqueloba lobis acute acuminatis, lobo medio quam ceteris majore, lobis exterioribus minimis circiter 30 cm. diametro, margine dentibus apiculatis grossiuscule serrata, basi profunde cordata, 7-nervia, supra asperule stellato-pubescentia nervis prominulis venis impressis, subtus dense pubescentia vel tomentosa nervis et venis prominentibus; petioli circiter 22 cm. longi, breviter dense hirsuti. *Stipulae* lineari-lanceolatae, 1·8 cm. longae. *Cymae* instar corymborum, circiter 15-florae, ex dichasio simplice ramis cincinnalibus constantes. *Pedunculus* 15–19 cm. longus, ut pedicelli molliter pilosus; pedicelli 2·5-3 cm. longi. *Bracteolae* flores singulos involucrantes, deciduae, ovato-lanceolatae, caudato-acuminatae, 1·5–2 cm. longae. 3·5–5·5 mm. latae, stellato-pubescentes. *Calycis* segmenta primum patula, demum reflexa, lanceolata, acuta, 1·6–1·7 cm. longa, 5–5·5 mm. lata, extra molliter stellato-pilosa, basi leviter connata. *Corolla* rosea, circiter 3·5 cm. diametro; petala late oblique obovata, leviter retusa vel subtruncata, 1·8–1·9 cm. longa, 1·5-1·7 cm. lata, tenuia. *Stamina* 15, cum staminodiis inferne monadelpha, in triades staminodiis singulis alternantes disposita; tubus staminalis albus, circiter 4 mm. longus; stamina lateralia triadum medio longiora; filamenta 6–8 mm. longa, sursum leviter angustata; antherae oblongae, 4–4·5 mm. longae; stamina media filamentis 4 mm. longis, antheris 3·5–4 mm. longis. *Staminodia* 5, subspathulata, 1·6–1·7 cm. longa, apicem versus roseo-tincta; pars superior lineari-lanceolata, subacuta, 1·3 mm. lata. *Ovarium* subglobosum, vix 6 mm. diametro, breviter albido-velutinum, 5-loculare; loculi 6–8-ovulati, intus pariete externo dense stellato-pilosi septis glabris; ovula ellipsoidea, vix 1 mm. longa; columna stylaris circiter 1 cm. longa, inferne stellato-pubescens, superne parce puberula, ramis 4·5 mm. longis revolutis.—T. A. SPRAGUE.

The interesting *Dombeya* here figured was raised at Kew from seed received in 1907 from Mr. J. M. Wood, the veteran Director of the Botanic Gardens at Durban, where it had been in cultivation under the name of *D. spectabilis*, Boj. When it flowered for the first time in February, 1911, it was found on examination that it is not Bojer's plant so

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named, but that it is the species described for the first time in 1900 by the late Dr. K. Schumann as *D. Calantha* and based by its author on herbarium specimens received at Kew in 1897 from Zomba in British Central Africa, where the plant had been collected by the late Mr. A. Whyte and by Mr. J. M. McClounie. The examination of flowers of this cultivated specimen, and a re-examination of those of the original type, have shown that the number of ovules in a cell is usually 6–8, not 4–6 as Dr. Schumann was led to believe. This point, though apparently not important, deserves to be noted, owing to the fact that in this genus some stress has been laid by Dr. Schumann on the number of ovules present in each cell. Another character which Dr. Schumann has treated as of consequence is the presence or absence of stellate hairs within the ovary; it is to be noted that in the species now figured these stellate hairs occur, but that while present on the inner wall they are absent from the septa. The material from which our figure has been prepared was derived from a plant which has grown vigorously in a border in the Mexican house in Kew, and which, but for severe annual pruning, would have attained tree-like dimensions. It is an evergreen, and when loaded with flowers, which are of the same tint as, and bear a strong superficial resemblance to those of the Musk Mallow, is a singularly attractive object. Unfortunately at Kew it has failed to ripen seeds.

DESCRIPTION.—*Shrub*, erect, 11–12 ft. high. *Stem* $\frac{3}{4}$ in. thick, brownish-velvety, marked below with leaf-scars; lateral twigs few and short, bearing small undivided or lobed leaves. *Leaves* 3-lobed or somewhat 5-lobed, lobes acutely acuminate, the mid-lobe largest, the lateral lobes very small, about 12 in. across, margin coarsely acutely toothed, base deep cordate, 7-nerved, above harshly stellate pubescent with sunk nerves, beneath densely pubescent or tomentose with raised nerves and veins; petioles 8–9 in. long, shortly densely hairy; stipules linear-lanceolate, $\frac{3}{4}$ in. long. *Cymes* corymbiform, about 15-flowered, each branch of the simple dichasium being a scorpioid cyme. *Peduncles* 6–8 in. long and pedicels 1–1$\frac{1}{4}$ in. long, softly pilose; bracteoles each enclosing a solitary flower, deciduous, ovate-lanceolate, caudate-acuminate, $\frac{1}{2}$–$\frac{3}{4}$ in. long, 2–3 lin. wide, stellate pubescent. *Calyx lobes* at first spreading, then reflexed, lanceolate, acute, $\frac{2}{3}$ in. long, under 3 lin. wide, softly stellate pilose outside, shortly connate below. *Corolla* rose-coloured, about $1\frac{1}{2}$ in. across; petals widely obliquely obovate, slightly retuse or subtruncate, $\frac{2}{3}$ in. long, 7–8 lin. wide, delicate. *Stamens* 15 and staminodes 5, conjointly united in a short white tube about 2 lin. deep, each staminode alternating with three stamens; lateral stamens of each triad with filaments 3–4 lin. long and anthers over 2 lin. long, central with filament 2 lin. long and anthers 2 lin. long or shorter; staminodes subspathulate, $\frac{2}{3}$ in. long, tinged with rose towards the tip, the upper portion linear-lanceolate, subacute, under 1 lin. wide. *Ovary* subglobose, under 3 lin. wide, shortly white-velvety, 5-celled; cells 6–8 ovuled, densely stellate hairy within on the walls but not on the septa; ovules ellipsoid, very small; style-column about 5 lin. long, stellate pubescent below, sparingly puberulous above; style-arms revolute, about 2 lin. long.

Fig. 1, petal; 2, staminal column, laid open; 3, pistil; 4, hairs:—*all enlarged.*

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Tab. 8425.

COROKIA Cotoneaster.

New Zealand.

Cornaceae. Tribe Corneae.

Corokia, *A. Cunn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 949.

Corokia Cotoneaster, *Raoul in Ann. Sci. Nat.* 1844, vol. ii. p. 120 *et in Choix Pl. N. Zél.* p. 22; *Hook. f. Flor. N. Zeal.* vol. i. p. 98 *et in Handb. N. Zeal. Fl.* p. 238; *De Wild. Ic. Hort. Then.* vol. ii. p. 140, t. 83; species *C. buddleoidi*, A. Cunn., affinis, sed ramis paucifloris abbreviatis, foliisque facile distinguenda.

Frutex 1–2 m. altus, ramosissimus; rami abbreviati, plerumque 2–3 cm. longi, rigidi, atro-rubri, divaricato-tortuosi, juniores flores et folia gerentes, seniores plus minusve attenuati, nudi. *Folia* alterna, secus ramos abbreviatos in fasciculos 3-folios disposita, brevissime petiolata, spathulata, apice emarginata vel interdum apiculata, 10–12 mm. longa, 5–7 mm. lata, supra nitida, infra albo-tomentosa, juniores supra pubescentia, nervis obscuris. *Flores* axillares solitarii, pedunculis 3 mm. longis albo-tomentosis. *Sepala* 5, triangularia, 1 mm. longa, albo-tomentosa, persistentia. *Petala* 5, oblonga, 6 mm. longa, apice acutiuscula, basi squamula ciliato-fimbriata instructa, persistentia. *Stamina* 5, petalis alterna; filamenta 3 mm. longa, glabra; antherae 2 mm. longae. *Discus* carnosus, glaber, integer, apice planus, aurantiacus. *Receptaculum* turbinatum, albo-tomentosum. *Ovarium* 1-loculare, 1-ovulatum; stylus 2·5 mm. longus, glaber; stigma capitatum, obscure 2-lobum. *Fructus* drupaceus, ruber, 10 mm. longus, 7 mm. diametro, sepalis petalisque persistentibus coronatus. —J. Hutchinson.

The *Corokia* here figured, *C. Cotoneaster*, is a native of New Zealand, where it is found both in the North and in the South Islands. A familiar plant in gardens, especially in the south and west of England and in Ireland, it is scarcely hardy in the open ground at Kew; it will survive a mild winter, but is injured or killed by a few severe frosts. On a south wall, however, it thrives excellently and flowers freely every May. The material from which our figure has been prepared was obtained from a plant grown by Canon Ellacombe at Bitton, near Bristol, which forms a bush in a sheltered corner of his remarkable garden, but otherwise is not protected. This specimen is now a shapely plant five or six feet high and shows the remarkably interlaced branches with their tiny leaves and bright yellow, starry flowers to excellent advantage. *C. Cotoneaster* will grow

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either in loamy or in peaty soil provided it be open and well drained, and can be increased by cuttings of firm twigs taken off in July and placed in gentle heat. Raoul and others describe the ovary as 2-celled with one ovule in each cell; De Wildeman has figured the ovary as 1-celled and directed attention to the fact that this is the usual arrangement. In all the flowers examined by Mr. Hutchinson only one loculus containing a single pendulous ovule has been found, his experience thus coinciding with that of De Wildeman, not with that of Raoul.

DESCRIPTION.—*Shrub*, 4–7 ft. high, much-branched; branches very short, usually about 1 in. long, rigid, very dark red, divaricate and interlaced, the younger with leaves and flowers, the older slender, naked. *Leaves* alternate, in groups of threes along the shorter branches, shortly petioled, spathulate, emarginate or occasionally apiculate at the tip, 5–6 lin. long, 2–4 lin. wide, shining above, white tomentose beneath, when young pubescent above; veins indistinct. *Flowers* axillary, solitary; peduncles 1½ lin. long, white tomentose. *Sepals* 5, triangular, very short, white tomentose, persistent. *Petals* 5, oblong, 3 lin. long, tip rather acute, base with a ciliate-fimbriate scale within, persistent. *Stamens* 5, alternating with the petals; filaments 1½ lin. long, glabrous; anthers 1 lin. long. *Disk* fleshy, glabrous, entire, margin uniform, orange-yellow. *Receptacle* turbinate, white tomentose. *Ovary* 1-celled, 1-ovuled; style about 1 lin. long, glabrous; stigma capitate, obscurely 2-lobed. *Fruit* drupe-like, red, 5 lin. long, 3½ lin. wide, tipped by the persistent sepals and petals.

Fig. 1, young leaf; 2, flower; 3, ovary and calyx, in vertical section; 4, hair; 5, petal; 6, scale from petal; 7, anther; 8, pistil; 9, fruit; 10, fruit in vertical section; 11, embryo:—*all enlarged except 9, which is of natural size.*

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TAB. 8426.

CEREUS SILVESTRII.

Argentine Republic.

CACTACEAE. Tribe ECHINOCACTEAE.

CEREUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 849.

Cereus Silvestrii, *Speg. in Anales del Museo Nacional de Buenos Aires*, vol. xi. p. 483; affinis *C. procumbenti*, Engelm., sed caulibus gracilioribus, pulvillis confertioribus, spinis numerosioribus et gracilioribus, floribus minoribus et miniatis differt.

Herba; caules prostrati vel centrales adscendentes, 3–10 cm. longi, 9–14 mm. crassi, 8-angulati, pallide virides; pulvilli 1·5–2·5 mm. sejuncti; aculei 16–20, setacei, 1·5–2 mm. longi, albi. *Flores* laterales, erecti, infundibuliformes; tubus 2·5–3 cm. longus, rectus, apice 9–10 mm. diametro, rufescens, squamis ovatis acutis perparvis longe pilosis laxe obtectus; segmenta 3-4-seriata, patula, 1·3–2 cm. longa, 4 mm. lata, lanceolata, acuta, pulchre miniata. *Stamina* inclusa; filamenta rubra; antherae ochroleucae. *Stylus* ochroleucus, stigmatibus 8–9.—N. E. BROWN.

The very beautiful *Cereus* which forms the subject of our plate is a native of Argentina, where it was originally discovered in the provinces of Tucuman and Salta by Dr. Philipp Silvester, in whose honour it was named. A member of the group of forms to which belongs *C. procumbens*, Engelm., figured at t. 7205 of this work, it is readily distinguished from that species by its more slender stems, its more closely approximate cushions of spines, the spines themselves being smaller; it differs also in having smaller flowers which are very unlike those of *C. pubescens* in colour. The plant which supplied the material for our illustration was purchased in the spring of 1911 for the Kew collection from Messrs. Haage & Schmidt, of Erfurt. In the catalogue of this firm a figure of the plant is given; that figure represents it as a compact many-stemmed herb of semi-dependent habit growing in a hanging pot. At Kew it flowered freely in May, 1911, in the house devoted to succulent plants. The elegance and the bright orange-scarlet colour of its flowers, exceptional in the genus, fully

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entitle it to horticultural favour. The cultural requirements of *C. Silvestrii* are a loamy soil and abundant sunshine; a fair allowance of water should be supplied in summer, with little or none at all in winter.

Description.—*Herb*; stems succulent, prostrate or the central ascending, 1¼–4 in. long, 4–7 lin. thick, 8-angled, pale-green; spine-cushions very closely set; spines 16–20 to a cushion, setaceous, 1 lin. long or shorter, white. *Flowers* showy, lateral, erect, infundibuliform; tube 1–1¼ in. long, straight, 4–5 lin. wide at the top, reddish, loosely clothed with very small, ovate acute, pilose scales; segments 3–4-seriate, spreading, ½–¾ in. long, 2 lin. wide, lanceolate, acute, brilliant orange scarlet. *Stamens* included; filaments red; anthers pale yellow. *Style* pale yellow, stigmas 8–9.

Fig. 1, a cushion of spines, from the stem; 2, scale with hairs, from the flower-tube; 3, stamen; 4, stigmas:—*all enlarged.*

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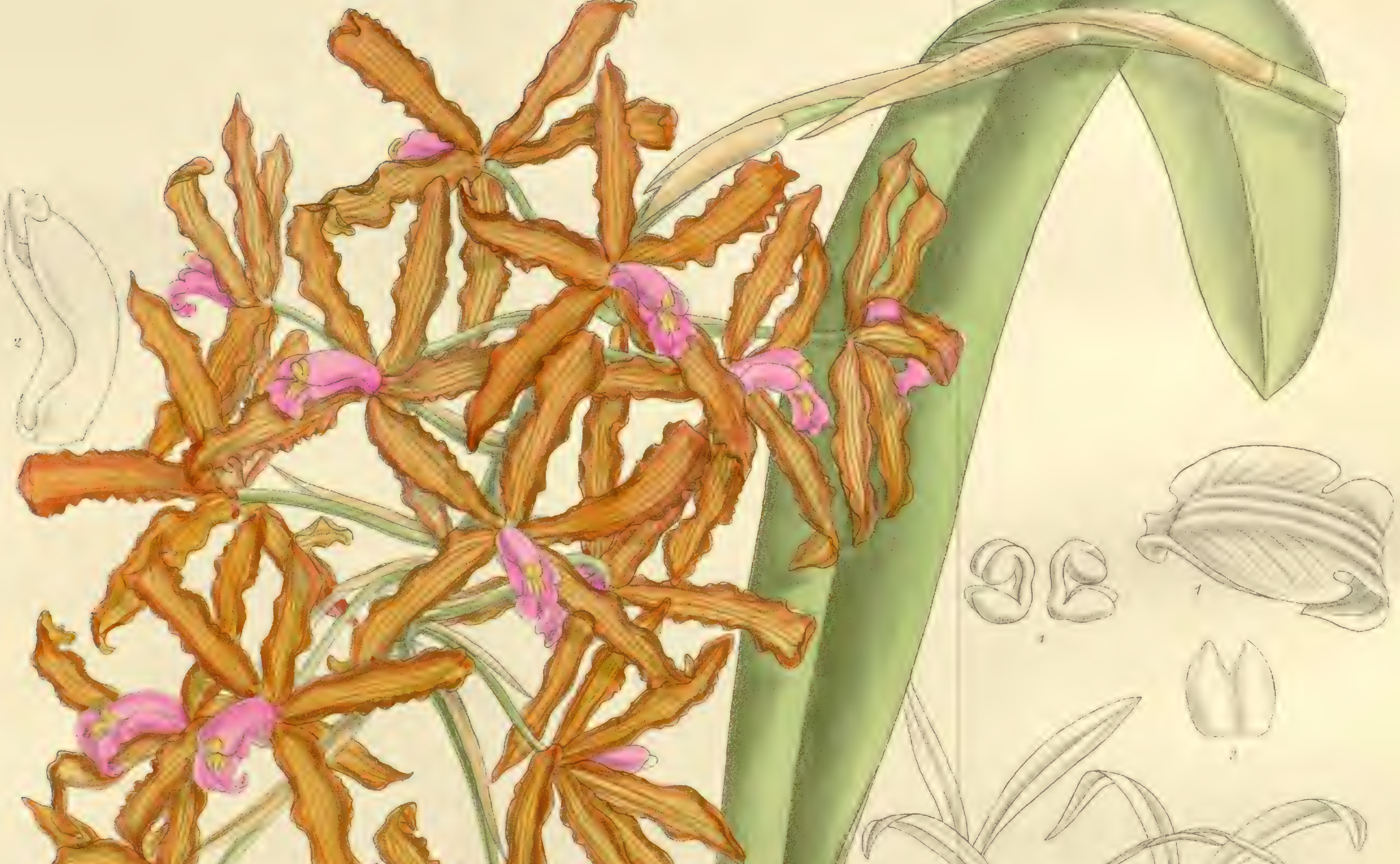

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TAB. 8427.

SCHOMBURGKIA LUEDDEMANI.

Venezuela.

ORCHIDACEAE. Tribe EPIDENDREAE.

SCHOMBURGKIA, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 534.

Schomburgkia Lueddemani, *Prill. in Journ. Soc. Imp. Hort. Paris,* vol. viii. (1862) p. 275; affinis *S. undulatae,* Lindl., sed pseudobulbis gracilioribus, bracteis longioribus et colore florum differt.

Herba epiphytica, rhizomate valido, vaginis late ovatis subimbricatis obtecto. *Pseudobulbi* erecti, fusiformi-clavati, sulcati, basi attenuati, vaginis distichis imbricatis obtecti, 15–25 cm. longi, medio 2·5–3 cm. lati, apice saepissime diphylli. *Folia* arcuata, elongato-oblonga, subobtusa, coriacea, 20–35 cm. longa, 4–5 cm. lata. *Scapi* erecti, elongati, 45–60 cm. alti, vaginis lanceolatis numerosis obtecti, apice multiflori. *Bracteae* lineari-lanceolatae, acutae, convolutae, 4 cm. longae. *Pedicelli* 3·5 cm. longi. *Flores* mediocres, brunnei, labellum columnaque purpureum, crista et anthera flavae. *Sepala* patentia, lineari-oblonga, obtusa, valde undulata, 3–4 cm. longa. *Petala* sepalis similia. *Labellum* trilobum, facie columnae adpressum, 1·5 cm. longum; lobi laterales anguste oblongi, obtusi, suberecti; lobus intermedius recurvus, ovato-orbicularis, apiculatus, circiter 7 mm. longus, marginibus prope apicem incurvis; discus tricarinatus. *Columna* clavata, arcuata, 1·5 cm. longa; anthera breviter bicornuta; pollinia 8, per paria superposita, a latere parallele compressa, appendicula granulosa laminiformi connexa.—R. A. ROLFE.

The *Schomburgkia* which forms the subject of our illustration is an Orchid which is interesting as having reappeared after having been lost sight of for half a century. The species was first described by Mr. E. Prillieux in 1862 from a specimen in the collection of Mr. Lüddeman in Paris, but nothing was then known of its native country or of its history, though its affinity with *S. undulata,* Lindl., was pointed out and especial attention was drawn to the bright yellow patch on the lip which is a conspicuous feature of the plant. In January, 1908, an auction sale of surplus orchids from the collection of the Hon. W. Rothschild, Tring Park, was held in London. At this sale the plant from which our figure has been prepared was purchased for the Kew

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collection. Its identity was unknown, but the plant was reported to have been received originally from Venezuela. This plant has been grown in a teak basket in a mixture of peat and sphagnum in a warm house along with *S. undulata* and other species of the genus, and has thriven well under this treatment. It was not, however, until January, 1911, that the plant flowered for the first time at Kew. When it did flower it was found to possess all the features characteristic of the species which Prillieux had named *S. Lueddemani.* Like other Schomburgkias the plant requires a liberal allowance of direct sunshine, and after a season's growth is completed should be kept, for a few weeks, dry at the roots.

DESCRIPTION.—*Herb*, epiphytic; rhizome stout, clothed with broad, ovate, somewhat imbricate sheaths; pseudobulbs erect, fusiformly clavate, sulcate, narrowed to the base, clothed with distichous imbricate sheaths, 6–10 in. long, 1–1¼ in. thick about the middle, often 2-leaved at the tip. *Leaves* arcuate, elongated oblong, somewhat obtuse, coriaceous, 8–14 in. long, 1¾–2 in. wide. *Scapes* erect, elongated, 1½–2 ft. long, clothed with many lanceolate sheaths, many-flowered; bracts linear-lanceolate, acute, convolute, 1¾ in. long; pedicels 1½ in. long. *Flowers* of medium size, brown with purple lip and column, the crest and anther yellow. *Sepals* spreading, linear-oblong, obtuse, markedly undulate, 1½–1¾ in. long. *Petals* like the sepals. *Lip* 3-lobed, adpressed to the face of the column, ⅔ in. long; lateral lobes narrow oblong, obtuse, suberect; mid lobe recurved, ovate-orbicular, apiculate, about ¼ in. long, the edges incurved near the tip; disk 3-keeled. *Column* clavate, arcuate, ⅔ in. long; anther with 2 short processes; pollinia 8, superposed in pairs, laterally compressed, united by a granular laminar appendage.

Fig. 1, lip; 2, column; 3, anther-cap; 4, pollinia; 5, sketch of entire plant: —*all enlarged except 5, which is much reduced.*

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Tab. 8428.

MAGNOLIA Kobus.

Japan.

Magnoliaceae. Tribe Magnolieae.

Magnolia, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 18.

Magnolia Kobus, *DC. Syst.* vol. i. p. 456 *et Prodr.* vol. i. p. 81; *Miq. Prolus. Fl. Jap.* p. 146; *Sargent, For. Fl. Jap.* p. 9, t. 3; *Gard. Chron.* 1905, vol. xxxvii. p. 265, cum ic.; *Shirasawa, Ic. Jap.* vol. i. t. 39, fig. 1–12; *C. K. Schneider, Ill. Handb. Laubholzk.* vol. i. p. 329; species *M. stellatae*, Maxim., et *M. salicifoliae*, Maxim., affinis; ab illa statura altiore et petalis paucioribus latioribusque, ab hac gemmis pedunculisque pubescentibus et foliis majoribus subtus haud glaucis facillime distinguenda.

Arbor, culta 4–5-metralis jam florifera, sylvatica 20–25-metralis; coma juventute anguste pyramidali, demum subsphaerica; ramuli attriti aromatici, hornotini intense brunnei nodis pubescentibus, annotini fere atri, glabrescentes; gemmae pubescentes. *Folia* decidua, obovata, basi cuneata, apice obtuse cuspidata, margine integra, 10–18 cm. longa, 5–10 cm. lata, glabra vel glabrescentia, subtus conspicue reticulata; petioli 1·25–2·5 cm. longi. *Flores* speciosi, 10 cm. lati, ad apices ramulorum lateralium solitarii. *Sepala* 3, subulata, caduca, 1·5 cm. longa, viridescentia, glabra. *Petala* 6, alba sed extra medio purpureo-lineata, 2-seriata, exteriora 3 oblongo-spathulata, 5 cm. longa, 2 cm. lata, interiora 3 angustiora paulo breviora. *Stamina* numerosissima; filamenta purpurea, 2 mm. longa; antherae lutescentes, applanatae, 6 mm. longae. *Carpella* secus axin centralem in columnam subcylindricam 1·5–2 cm. longam aggregata. *Fructus* 10 cm. longus, brunneus, saepe contortus curvatusve. *Semina* miniata, 8 mm. lata.—W. J. Bean.

Although the *Magnolia* here figured is less effective than some other members of the genus so far as its flowers are concerned, it is at least in one of its forms one of the most striking. If, for the genus, the flowers be small, the tree which bears them is, according to Professor Sargent, in the neighbourhood of Sapporo in Japan, one that attains a height of over 70 feet with a straight clean trunk 6 feet in girth. In stature therefore it rivals *M. hypoleuca*, Sieb. and Zucc., another native of Japan figured at t. 8077 of this work, and *M. acuminata*, Linn., f., from the eastern United States. The nearest allies of *M. Kobus* are, however, *M. stellata*, Maxim., figured at t. 6370 of this work, which is always a small shrub and which has from twelve

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to twenty petals to a flower, and *M. salicifolia*, Maxim., which has glabrous peduncles and winter-buds with narrower leaves that are glaucous beneath. But besides the lofty form alluded to, which Sargent has treated as a distinct variety, var. *borealis*, there is another form of *M. Kobus*, also represented in European collections, which while it never attains the dimensions of the Sapporo tree, differs from its companion in flowering more freely while still young and in having smaller leaves and more slender twigs. This second form, the one on which the original description of the species was based, is that to which the plant whence our material was derived belongs. That form was first introduced to England about 1879 by Mr. C. Maries when collecting for Messrs. J. Veitch and Sons; the original tree is still in their nursery at Coombe Wood. The trees at Kew, which are now about 15 feet high, usually come into leaf early in April. The spray figured, which came from one of these, did not flower until May, 1911, the flowers of this *Magnolia*, like those of most early flowering trees and shrubs, having been retarded for three or four weeks by a long-continued cold spell. This circumstance also explains the forwardness of the foliage as depicted in our plate; as a rule the flowers appear on quite naked shoots. In gardens *M. Kobus* will be valued for its great hardiness, its shapely pyramidal form and its copious leafage. As a flowering tree it is also highly attractive, and in this respect it suffers from comparison only with other members of the same genus, which includes some of the finest flowering trees of the northern temperate zone. It likes a moist, deep, open soil and should be raised from imported seeds.

DESCRIPTION.—*Tree*, deciduous, of narrow pyramidal form when young, ultimately rounded, in one form 15–20 ft., in another 70–80 ft. in height; twigs aromatic when bruised, dark brown and silky about the nodes when young; almost black when a year old; winter-buds pubescent. *Leaves* obovate, cuneate at the base, bluntly cuspidate at the tip, entire, 4–7 in. long, 2–4 in. wide, glabrous or glabrescent, conspicuously reticulately veined beneath; petioles $\frac{1}{2}$–1 in. long. *Flowers* 4 in. across, solitary at the tips of short lateral twigs. *Sepals* 3, subulate, caducous, $\frac{5}{8}$ in. long, greenish, glabrous. *Petals* 6, pure white with a purple median line outside; the outer 3 about 2 in. long, $\frac{3}{4}$ in. wide, oblong-spathulate; the inner 3 rather narrower and shorter. *Stamens* very numerous; filaments purple, 1 lin. long; anthers yellowish, flattened, $\frac{1}{4}$ in. long. *Carpels* adnate throughout an erect cylindric column 7–9 lin. long. *Fruit* 4 in. long, brown, often curved and contorted owing to irregular development of the seeds. *Seeds* scarlet, 4 lin. in diameter.

Fig. 1, stamens and pistil; 2 and 3, anthers; 4, section of carpels:—*all enlarged.*

M.S. del. J.N.Fitch lith.

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TAB. 8429.

AGAVE PROTUBERANS.

Mexico.

AMARYLLIDACEAE. Tribe AGAVEAE.

AGAVE, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 738.

Agave protuberans, *Engelm. ex Baker, Handb. Amaryll.* p. 197; species ex affinitate *A. virginicae,* Linn., a qua floribus congestis tuboque perianthii multo breviore differt.

Herba, acaulescens. *Tuber* globosum, 5 cm. diametro, perenne. *Folia* radicalia, rosulata, subcarnosa, fragilia, lineari-lanceolata, 15–20 cm. longa, 3–4 cm. lata, supra canaliculata vel fere conduplicata, viridia, brunneo-purpureo-maculata, marginibus planis vel undulatis, angustissime albo-cartilagineis, minutissime denticulatis instructa. *Scapa* erecta, 60 cm. alta, 6 mm. diametro, rigida, subglauca. *Bracteae* lanceolatae, acuminatae, 4·5 cm. longae, sursum gradatim minores, crassae. *Spica* 10 cm. longa, densiflora; flores in papillas rhachidis tumidas singulatim insidentes; bracteolae 2, altera abaxialis, e basi deltoidea 6 mm. lata acuminata, 12 mm. longa, purpurascens, albo-marginata, altera lateralis, 4 mm. longa, 1·5 mm. lata, membranacea, albescens. *Perianthii* tubus 3 mm. longus; segmenta 1·5 cm. longa, 5 mm. lata, oblonga, obtusa, apice leviter cucullata, viridescentia, minute purpureo-maculata. *Filamenta* longe exserta, 4 cm. longa, subulata, alba, purpureo-maculata; antherae oblongae, 13 mm. longae, brunneo-purpureae. *Ovarium* 10 mm. longum, 6 mm. latum, 6-costatum, obliquum; stylus cylindricus, staminibus aequilongus; stigma incrassatum, trilobum.—*A. guttata,* Hemsl. Biol. Amer.-Centr. vol. iii. p. 343, tab. 87, non Jacobi et Bouché. *Leichtlinia protuberans,* Herm. Ross in Icon. Plant. Hort. Panorm. p. 8, tab. 3 (1896); Engl. & Prantl, Natürl. Pflanzenf. Nachtr. ii. p. 11, and iii. p. 49.—C. H. WRIGHT.

The subject of our illustration is one of those *Agaveae* which differ both from the true Agaves and from the Littaeas in having the flowers solitary on simple racemes or spikes and in having herbaceous leaves without a terminal pungent spine. Considerable diversity of opinion has existed with regard to the status of the group which about a century ago appeared to Salisbury entitled to generic recognition, though the name *Manfreda,* proposed by him for *Agave virginica,* Linn., figured at t. 1157 of this work, was not published until 1866. Thirty years later H. Ross treated the group as a distinct genus *Leichtlinia,* a name bestowed upon the species now figured because of its introduction by the late Mr. Max Leichtlin. But the structure of the flowers in all species of *Manfreda,* which

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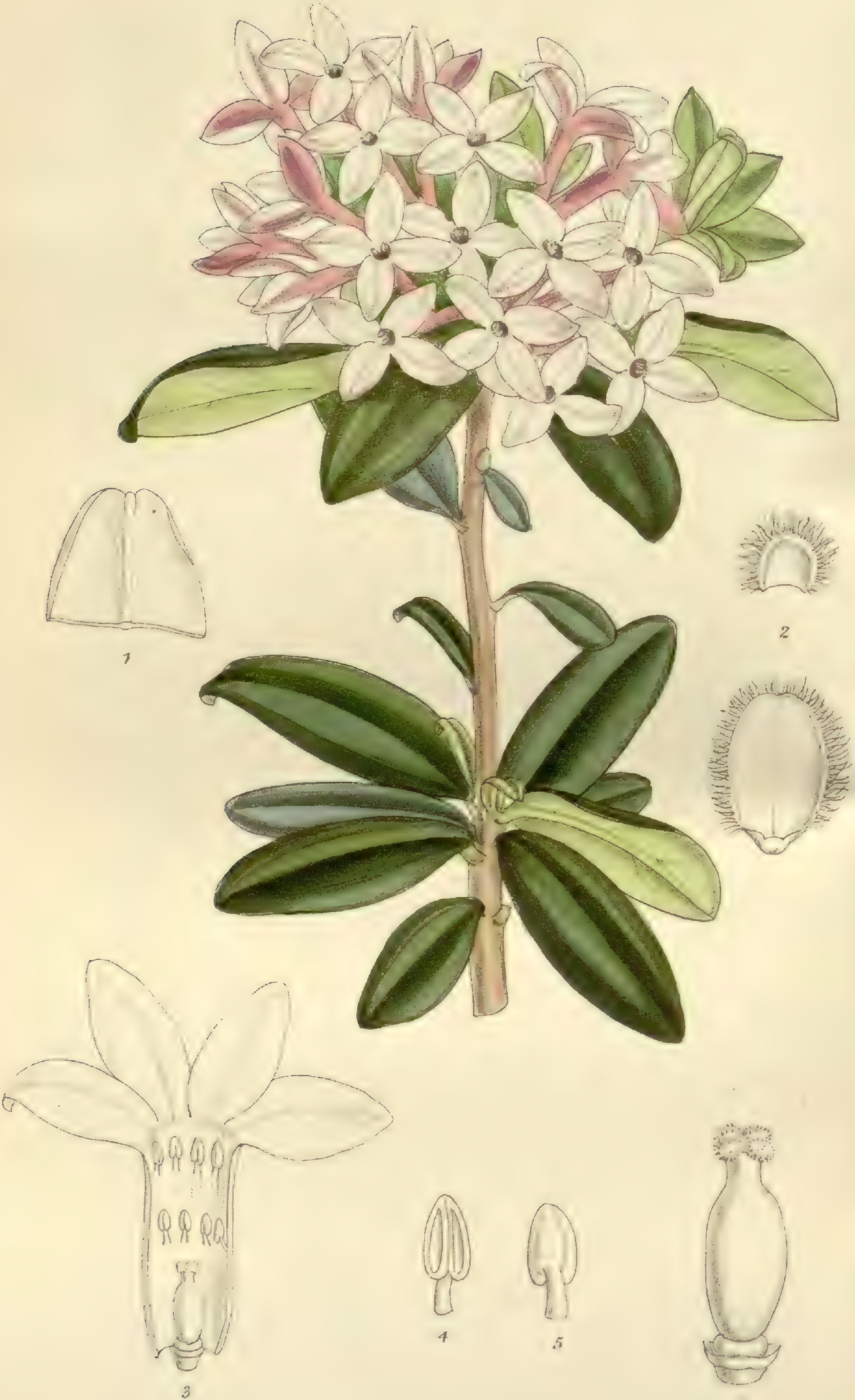
name takes precedence of *Leichtlinia*, agrees so well with that of the Agaves and the Littaeas that it seems desirable to consider the group a subgenus of *Agave*. All the Manfredas are Mexican with the exception of *A. virginica* which is confined to the Southern United States. One of the best known is *A. maculata*, Regel, figured at t. 5122 of this work as "A. maculosa." The Kew plant of *A. protuberans* was received from Mr. Leichtlin in 1882 shortly after its introduction from Mexico, where it inhabits the mountains near San Luis Potosi at altitudes of 6,000–8,000 feet above sea level. The species flowered in 1908 with Mr. R. H. Beamish at Glounthaune near Cork, and in June, 1910, at Colesborne, with Mr. H. J. Elwes, to whom we are indebted for the material for our figure. Like the other Manfredas, *A. protuberans* requires greenhouse conditions.

DESCRIPTION.—*Herb*; stemless; tuber globose, 2 in. wide, perennial. *Leaves* radical, rosulate, somewhat fleshy, fragile, linear-lanceolate, 6–8 in. long, 1¼–1¾ in. wide, above channelled or almost conduplicate, green blotched with brownish purple, margins even or waved, narrowly white-cartilaginous and very finely denticulate. *Scape* erect, 2 ft. high, ¼ in. thick, rigid and slightly glaucous; bracts lanceolate, acuminate, the largest 1½ in. long or longer, gradually diminishing upward, thick. *Spike* 4 in. long, dense-flowered; flowers solitary on the swollen nodes of the rachis; bracteoles 2, an abaxial with a deltoid base ¼ in. wide, acuminate at the tip, reaching ½ in. in length, purplish with white margins, and a lateral which is much smaller, membranous and whitish. *Perianth* with a short tube, only ⅛ in. long, and with oblong, obtuse segments slightly hooded at the tip, greenish and finely blotched with purple, ⅓ in. long, ⅕ in. wide. *Filaments* far exserted, 1¾ in. long, subulate, white blotched with purple; anthers oblong, ½ in. long, brownish purple. *Ovary* ⅓ in. long, ¼ in. wide, 6-ribbed, oblique; style cylindric, as long as the stamens; stigma thickened, 3-lobed.

Fig. 1, portion of perianth, showing staminal insertion and stamens; 2, pistil, showing ovary in vertical section; 3, transverse section of ovary; 4, ovule; 5, sketch of an entire plant:—*all enlarged except 5, which is much reduced.*

8430.



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TAB. 8430.

DAPHNE RETUSA.

Western China.

THYMELAEACEAE. Tribe THYMELAEAE.

DAPHNE, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 190.

Daphne retusa, *Hemsl. in Journ. Linn. Soc. Bot.* vol. xxix. p. 318; *Keissler in Engl. Bot. Jahrb.* vol. xxv. p. 96; *Pritzel in Engl. Bot. Jahrb.* vol. xxix. p. 481; species *D. odorae,* Thunb. affinis sed statura humili, foliis multo minoribus plerumque retusis perulisque dense ciliatis differt.

Fruticulus densissime ramosus, 6–10 dm. altus, subglobosus, vere cum foliis novellis florens. *Rami* novelli magis minusve pubescentes, demum glabrati, annotini cortice pallide brunneo tecti. *Folia* in annum secundum persistentia, oblonga vel oblanceolato-oblonga, obtusa, plerumque retusa, basi in petiolum perbrevem latiusculum attenuata, exsiccando interdum ob margines valde revolutas specie oblongo-linearia, 3–7 cm. longa, 8–17 mm. lata, coriacea, glaberrima, supra saturate viridia, subtus pallida, nervis obsoletis. *Flores* e gemmis terminalibus perulatis orti, umbellatim dispositi, ramulis foliisque novellis stipati et foliis nonnullis vetustis suffulti. *Gemmae* 1 cm. longae, perulis oblongis vel ellipticis obtusis vel acutis ad margines dense ciliatis caeterum glabris. *Perianthium* album, magis minusve roseo- vel violaceo-suffusum vel extra totum violaceoroseum, glabrum; tubus cylindricus 10–12 mm. longus; lobi ovati, obtusiusculi, ad 10 mm. longi, 5 mm. lati. *Stamina* 2-seriata, series circiter 4 mm. distantes, inferior medio tubo inserta antheris haud exsertis. *Ovarium* glabrum, stigmate capitato, stylo brevissimo. *Bacca* subglobosa, carnosa, rubra, 10 mm. longa, 8 mm. diametro.—O. STAPF.

The interesting *Daphne* here figured was first discovered by Mr. A. E. Pratt in 1889 at altitudes of between 9,000 and 13,000 feet in the neighbourhood of Tatien-lu in Western Szechuan. In 1903 it was again collected in the same district by Mr. E. H. Wilson, and was sent by him to Messrs. J. Veitch and Sons who have raised it in their nursery at Coombe Wood. The material on which our illustration has been based came from a plant in the Coombe Wood nursery, where it is an evergreen shrub of compact and shapely form, about eighteen inches high and as much wide, well furnished with shining dark green foliage. The flowers, which are freely produced in early May along with the new leaves, have all the pleasing fragrance that is characteristic of the genus, which, taken as a whole, is not very easy to cultivate. Judging, how-

APRIL, 1912.

ever, by the appearance of the plants at Coombe Wood, *D. retusa* promises to be more amenable to treatment than most. It will probably have to be propagated by grafting, and an evergreen species like the familiar *D. Laureola* should be tried as a stock, although it may be possible to work it on the deciduous *D. Mezereon* as well. *D. retusa* approaches very closely to *D. tangutica*, Maxim., a species described from specimens collected in Western Kansu, and differs from the Kansu plant, if the only specimen of the latter at Kew can be relied upon, mainly in having more hairy young branches, broader and less revolute leaves, more densely ciliate perulae and more obtuse perianth segments.

DESCRIPTION.—*Shrub*, of small size, densely branched, 2–3½ ft. high, crown subglobose, flowering in spring contemporaneously with the new leaves. *Twigs* more or less pubescent but soon becoming glabrous; when a year old with greyish brown bark. *Leaves* lasting till a second year, oblong or oblanceolate-oblong, obtuse, often retuse, narrowed at the base to a short rather broad petiole, as they dry up often assuming owing to their margins becoming inturned a linear or oblong-linear appearance, 1¼–3 in. long, ⅓–⅔ in. wide, coriaceous, quite glabrous dark green above, pale beneath, the veins obscure. *Flowers* umbellately arranged, produced from the terminal scaly buds, accompanied by young twigs and new leaves and surrounded below by a few leaves of the previous season. *Buds* 5 lin. long, scales oblong or elliptic, obtuse or acute, with densely ciliate edges, but elsewhere glabrous. *Perianth* white, more or less tinged with rose or violet, or outside quite violet-rose, glabrous; tube cylindric 5–6 lin. long; lobes ovate, rather obtuse, 5 lin. long, half as wide. *Stamens* in 2 series, about 2 lin. apart; the lower series about the middle of the tube, the anthers included. *Ovary* glabrous, style very short, stigma capitate. *Berry* subglobose, fleshy, red, 5 lin. long, 4 lin. in diameter.

Fig. 1, apex of leaf; 2, bud scales; 3, perianth, laid open; 4 and 5, stamens; 6, pistil:—*all enlarged.*

8431.

M.S. del. J.N. Fitch lith.

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TAB. 8431.

CAMPANULA ARVATICA.

Spain.

CAMPANULACEAE. Tribe CAMPANULEAE.

CAMPANULA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 561.

Campanula arvatica, *Lag. in Varied. de Ciencias,* 1805, p. 40, *et in Gen. et Spec. Nov.* (1816) p. 12; *Feer in Journ. de Bot.* vol. iv. (1890) p. 339; *Willkomm, Fl. Hisp. Suppl.* p. 130; species *C. Morettianae,* Reichb., affinis sed foliis minoribus glabris corollisque latius campanulatis distinguenda.

Herba perennis, rhizomate centrali caules plures quoquoversus emittente. *Caules* graciles, subangulati, glabri, foliati, uni- vel pauci-flori, 10–20 cm. longi. *Folia* basilaria 8–9 mm. longa, 8–10 mm. lata, cordato-rotundata, petiolis ad 2 cm. longis suffulta, caulina alterna, 6–8 mm. longa, 4–6 mm. lata, rhomboidea, breviter petiolata, summa sessilia, omnia apice apiculata, acute dentata, glabra, nervis obscuris primariis 5. *Flores* et terminales et axillares, ad caulium vel ramorum apices solitarii. *Sepala* 5, lineari-subulata, 5 mm. longa, accrescentia, marginibus quibusque dente solitario circiter medium instructis. *Corolla* late campanulata, 2·5–3 cm. diametro, coerulea, lobis 5 patulis 8 mm. longis 6–8 mm. latis. *Stamina* 5, filamentis 3 mm. longis 1 mm. a basi expansis, parte expansa 0·75 mm. lata ciliata, antheris 3 mm. longis. *Receptaculum* glabrum, 3 mm. altum. *Stylus* 1 cm. longus, exsertus; stigma trilobum, lobis 1·5 mm. longis. *Capsula* fere cylindrica, glabra, 6 mm. longa. *Semina* cylindrica 1·25 mm. longa, 0·5 mm. diametro.—*C. acutangula,* Ler. et Lev. in Journ. Bot. vol. xvii. (1879) p. 198, et Deux Excurs. bot. dans le nord de l'Espagne, p. 51, t. vii.; Gard. Chron. 1911, vol. l. p. 220, fig. 104.—W. B. TURRILL.

The very interesting *Campanula* here figured is a species which is endemic in Northern Spain, where it is confined to that portion of the Cantabrian mountains known as the Picos di Europa which lies between the provinces of Leon and Asturias. It was first recognised as a distinct species under the name *C. arvatica* more than a century ago, but appears to have been lost sight of until some thirty years ago when it was rediscovered and again described by Leresche and Levier as *C. acutangula.* Its nearest ally in the genus is *C. Morettiana,* Reichb., a native of the Tirol, and occasionally in gardens it is treated as a variety of that species. The Spanish is, however, very readily distinguished from the Tirolese plant in being glabrous in all its parts, in having smaller leaves, more slender stems, and especially in having a more open and less distinctly funnel-shaped corolla. Though the names *C. acutangula* or *C. Morettiana* var. *acutangula* appear to have become generally adopted in collections, Feer has made it perfectly clear that they are only recent substitutes for the original name and must therefore be set aside. The plant from which the material for our figure was obtained is one purchased for the Kew collection in 1909 from Mr. H. Correvon, of Geneva, under the name proposed by Leresche and Levier. It forms a close prostrate tuft about 2 inches high and should be planted in a sheltered position in well-drained shingly soil. The flowers are produced in July; unfortunately the species has not proved hardy at Kew.

DESCRIPTION.—*Herb*, perennial; rootstock central, giving out numerous stems in all directions. *Stems* slender, slightly angular, glabrous, leafy, one- or more-flowered, 4–8 in. long. *Leaves* dimorphic; basal about $\frac{1}{3}$ in. long, slightly broader than long, cordate-rounded, with petioles $\frac{1}{2}$–$\frac{3}{4}$ in. long; cauline alternate, 3–4 lin. long, 2–3 lin. wide, rhomboid, shortly petioled or the uppermost sessile; all apiculate, sharply toothed, glabrous, with 5 obscure main-nerves. *Flowers* solitary, or both terminal and axillary at the ends of the stems and branches. *Sepals* 5, linear-subulate, 2$\frac{1}{2}$ lin. long, accrescent, each with a solitary tooth on either margin near the middle. *Corolla* wide campanulate, 1–1$\frac{1}{4}$ in. across, blue; lobes 5, spreading, 4 lin. long, 3–4 lin. wide. *Stamens* 5, filaments 1$\frac{1}{2}$ lin. long, each widening a little above the base into a suborbicular ciliate plate; anthers as long as the filaments. *Receptacle* glabrous, 1$\frac{1}{2}$ lin. high. *Style* 5 lin. long, exserted; stigma 3-lobed, lobes under 1 lin. long. *Capsule* nearly cylindric, glabrous, 3 lin. long. *Seeds* cylindric, small.

Fig. 1, bud, the corolla removed; 2 and 3, stamens; 4, stigma; 5, an unripe capsule; 6, a seed:—*all enlarged.*

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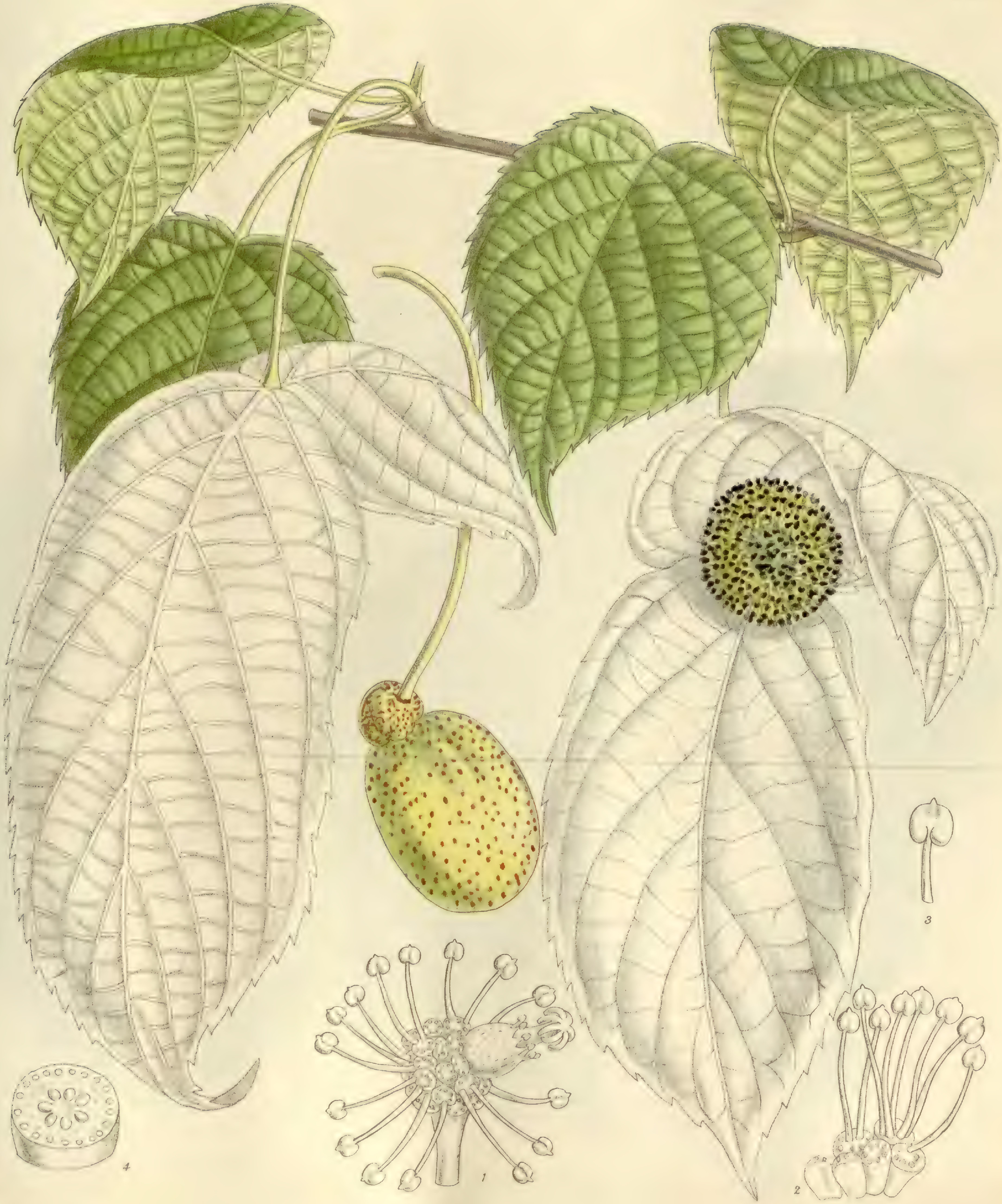

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TAB. 8432.

DAVIDIA INVOLUCRATA, var. VILMORINIANA.

Central and Western China.

CORNACEAE. Tribe NYSSEAE.

DAVIDIA, *Baill. Adans.* vol. x. (1871), p. 115, *et in Nouv. Arch. Mus. Hist. Nat. Par.* sér. 2, vol. viii. (1885), p. 242, t. 10.

Davidia involucrata, var. Vilmoriniana, *Hemsl.*; **a** *D. involucrata* **typica foliis subtus haud albo-tomentosis differt.**

Arbor elegans mediocris, foliis iis *Tiliae* specierum nonnullarum similibus, inflorescentia capitata, bracteis 2 amplis albis ornata. *Folia* alterna, exstipulata, longe petiolata; lamina papyracea, ovato- vel orbiculari-cordata, absque petiolo 6–12 cm. longa, abrupte caudato-acuminata, margine grosse glanduloso- vel calloso-serrata, primum pilis longis appressis praecipue secus costam nervosque vestita, cito glabrescentia; venae primariae utrinque 5–7, sat prominentes, furcatae; petiolus fere teres, supra anguste canaliculatus, gracilis, flexilis, 4–10 cm. longus. *Inflorescentia* pseudoterminalis, capitata, longe pedunculata, pendula, monogama vel heterogama; pedunculus floriger 5–8 cm. longus, prope apicem bibracteatus, fructiger 8–10 cm. longus; bracteae suboppositae, sessiles, saepissime inaequales, foliaceae, foliis similes sed albae, membranaceae, oblongo-lanceolatae vel oblanceolatae, basi rotundatae vel subcordatae, acuminatae, longiores usque ad 15 cm. longae, per anthesin capitulum nutantem superimpendentes, cito deciduae. *Capitulum* saepius heterogamum, circiter 3 cm. diametro, multiflorum, florem unicum hermaphroditum et flores numerosos masculinos gerens, nunc omnino masculinum, nunc flore femineo solitario; receptaculum subglobosum, ebracteolatum. *Flores masculini* sessiles, achlamydei (vel perianthium pulviniforme). *Stamina* 1–7 (interdum usque ad 12, fide *Hornei*) annulatim posita; filamenta bene evoluta, filiformia; antherae purpureae, cordiformes, biloculares, apiculatae. *Flos hermaphroditus* (an vere hermaphroditus?) brevissime pedicellatus, in receptaculo globoso oblique insertus. *Perianthium* nullum vel ad squamulas minutas inter stamina epigynas redactum. *Stamina* 5–10 vel numerosiora (interdum usque ad 26, fide *Hornei*), epigyna, parva, imperfecta (an semper?). *Ovarium* inferum, saepissime 7-loculare, loculis uniovulatis; styli lobi loculis isomeri, arcte recurvi; ovula pendula. *Fructus* drupaceus, ellipsoideus, circiter 4 cm. diametro maximo, flavo-viridis, brunneo-punctatus; epicarpium et mesocarpium tenuia; endocarpium osseum, durissimum; dehiscentia per valvulas dorsales ab apice usque ad medium fructus deciduas; embryo in endospermio tenui rectus, radicula superiore quam cotyledonibus oblongis paullo breviore.—*Davidia Vilmoriniana*, Dode in Rev. Hort. 1908, p. 406. *D. involucrata*, Oliv. in Hook. Ic. Plant. t. 1961, et Gard. Chron. vol. xxxix. (1906), p. 346 cum figura.—W. B. HEMSLEY.

Davidia was one of the earliest and is certainly one of the most striking of the novelties discovered in Western China when the botanical exploration of that region was begun over forty years ago. The first specimens were transmitted to the late Professor Baillon by the Abbé

David in 1869; the first to reach Kew were collected by Mr. A. Henry in 1889. Horticulture owes the introduction of the genus into cultivation to Père Farges, who sent seeds, from which a solitary plant was raised, to Messrs. Vilmorin in 1897. Farges sent a second supply of seeds in 1898, and in 1899 Mr. E. H. Wilson sent to Messrs. J. Veitch & Sons a third consignment, from which a large stock of plants was obtained. The original tree raised in 1897 flowered for the first time in the collection of Mr. M. L. de Vilmorin at Les Barres in 1906 and was figured in the Gardeners' Chronicle that year on 2nd June at p. 346. The trees in the nursery of Messrs. Veitch at Coombe Wood flowered for the first time in 1911, and a figure was given in the Gardeners' Chronicle that year on 27th May at p. 329. Both of these figures represent conditions with relatively small flowers. Meanwhile, however, the original tree at Les Barres has at last developed its full beauty, and from this tree has been obtained the material on which our illustration has been based, the fruiting specimens having been supplied by Mr. M. L. de Vilmorin in October, 1908, the flowering sprays in May, 1911. Mr. Hemsley has discussed the history of the introduction of *Davidia* in the Kew Bulletin for 1907 at p. 301, and described the germination of the seeds in the Linnean Society's Journal, vol. xxxv. at p. 556, while Mr. A. S. Horne has dealt exhaustively with the structure and affinities of this remarkable plant in the Linnean Society's Transactions, series 2, vol. vii. at p. 303. The various forms which it assumes are considered by Mr. Hemsley, Mr. M. L. de Vilmorin, and Mr. E. H. Wilson to be no more than varieties of one species. Mr. L. R. Dode, however, is inclined to distinguish three species, recognisable by the colour and the degree of pubescence of their leaves. As a tree for the climate of the British Isles *Davidia* possesses two very valuable characteristics: it starts into growth late and finishes early. Thus it escapes damage alike from late spring or from early autumn frosts. So far as the experience of the last ten years enables us to judge it is quite hardy. A vigorous feeder, it needs a deep, moist, well-drained loam. It can be increased by cuttings, but plants so raised do not grow with the clean vigour of seedlings.

DESCRIPTION.—*Tree* of medium height, with Linden-like foliage, and capitate inflorescences with two large white bracts. *Leaves* alternate, ovate- or orbicular-cordate, abruptly caudate-acuminate, coarsely serrate with glandular or thickened teeth, 2¼–4½ in. long, 2–3 in. wide, at first adpressed hirsute, especially on the midrib and nerves, soon glabrous; main-nerves 5–7 on each side, rather prominent, forked; petiole slender, 1¾–4 in. long, almost cylindric, with a faint channel above; stipules 0. *Inflorescence* apparently terminal, capitate, pendulous, monogamous or heterogamous; peduncle 2-bracteate near the top, in flower 2–3 in., in fruit 3–4 in. long; bracts almost opposite, sessile, usually unequal, leafy, white, membranous, oblong-lanceolate or oblanceolate, acuminate, base rounded or subcordate, the longer up to 6 in. in length, overhanging the pendulous capitulum, soon deciduous. *Capitulum* generally heterogamous, about 1¼ in. across, many-flowered, with a solitary 2-sexual and many male florets, or with only male flowers, or only a solitary female flower; receptacle subglobose, without bracteoles. *Male flowers* sessile, naked or with perianth reduced to a swollen ring. *Stamens* 1–7, or sometimes (*Horne*) 12, attached annularly; filaments well developed, filiform; anthers purple, cordate, 2-locular, apiculate. *Hermaphrodite* (or apparently hermaphrodite) *flower* shortly pedicelled, obliquely set on the globose receptacle. *Perianth* 0, or reduced to minute epigynous scales mixed with the stamens. *Stamens* 5–10 or more—sometimes up to 26 (*Horne*); small, epigynous and usually apparently imperfect. *Ovary* inferior, generally 7-celled; cells 1-ovuled; style-lobes as many as cells, much recurved; ovules pendulous. *Fruit* drupe-like, ellipsoid, about 1¾ in. long, greenish-yellow with brown dots; epicarp and mesocarp thin; endocarp bony, very hard, opening by dorsal chinks extending to the middle of the fruit; embryo straight, enclosed in a thin endosperm; radicle superior, rather shorter than the oblong cotyledons.

Fig. 1, an inflorescence from which most of the stamens have fallen; 2, a cluster of male flowers from which most of the stamens have fallen; 3, a stamen; 4, ovary in transverse section:—*all enlarged.*

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TAB. 8433.

IRIS CHRYSOGRAPHES.

China.

IRIDACEAE. Tribe IRIDEAE.

IRIS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 686.

Iris chrysographes, *Dykes in Gard. Chron.* 1911, vol. xlix. p. 362; affinis *I. Forrestii*, Dykes, sed habitu, foliis minus arcte dispositis, florum colore et segmentorum exteriorum lamina magis deflexa oblongo- vel subobovato-elliptica distincta.

Herba rhizomatosa, circiter 4 dm. alta, pluricaulis. *Caules* simplices, folia 1–2 redacta gerentes, angustissime fistulosi, 1–2-flori. *Folia* linearia, superne longe attenuata, acuta, arcuatim extra curvata, 35–45 cm. longa, 7–8 mm. lata, viridia. *Spathae* angustae, virides, acutae, 5–7 cm. longae. *Pedicelli* 2·5–3·7 cm. longi. *Perigonii* tubus circiter 1 cm. longus; segmenta exteriora valde deflexa, lamina oblongo- vel subobovato-elliptica, 5 cm. longa, 2·5 cm. lata, pulcherrime atro-purpureo-violacea, velutino-papillosa, medio striis striolisque aureis notata, ungue lineari-oblongo, 2·5–3 cm. longo, rubro-purpureo, tenuiter aureo-maculato; segmenta interiora erecta, oblonga, obtusa, in unguem attenuata, eo incluso 6–6·5 cm. longa, 8–10 cm. lata, atro-purpureo-violacea. *Styli* rami saturate purpurei, cristae lobis ovatis obtusis. *Staminum* filamenta circiter 1·7 cm. longa, antherae 1·3 cm. longae. *Ovarium* 1·5 cm. longum.—O. STAPF.

The handsome *Iris* here figured was discovered in Western Szechuan in 1908, where it was found by Mr. E. H. Wilson growing in thickets near Kuan Hsien at elevations of from 7,000 to 11,000 feet above sea-level. The plant from which the material for our plate was obtained was grown by Mr. W. R. Dykes in his garden at Charterhouse, Godalming, from a seedling raised by Miss Willmott in her garden at Warley Place, Essex. It came into flower towards the end of May, 1911. A freely floriferous species and at the same time one of the most richly coloured of those now in cultivation, *I. chrysographes* promises to prove a favourite garden plant. As Mr. Dykes has pointed out in the Gardeners' Chronicle, the species is a member of the "Sibirica" group, and is closely allied to *I. Forrestii*, Dykes, but differs in colour of flower and in habit; it also flowers somewhat earlier than *I. Forrestii*.

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Among the more familiar species in collections it also approaches rather closely to *I. laevigata*, Fisch., but may be at once distinguished by its narrower, more sharply pointed spathes. The rich dark purple flowers with their velvety texture render the plant a very conspicuous object; the colour is well set off by the central line and the broken flanking streaks of golden yellow. These flanking streaks vary somewhat in number and extent, sometimes they are almost absent and only the central golden yellow line appears. Another species closely allied to *I. chrysographes* is *I. Delavayi*, Micheli, from Yunnan, which has, however, a different capsule and seeds, and as a garden plant is readily distinguished by its taller stature and by its blue purple flowers with white markings. Mr. Dykes finds that *I. chrysographes* is not difficult to grow in any soil that is fairly rich in humus and is not heavily charged with lime. It appears not to demand either the excessive moisture or the very retentive soil in which *I. Delavayi* best succeeds.

DESCRIPTION.—*Herb*; rhizome rather slender, giving off several rather slender unbranched stems, hollow with a narrow lumen, about 1¼–1½ ft. high, bearing 1–2 reduced leaves and 1–2 flowers. *Leaves* linear, much narrowed upwards, acute, curving outwards, 1¼–1½ ft. long, ¼–⅓ in. wide, green. *Spathes* narrow, green, acute, 2–2½ in. long. *Pedicels* 1–1½ in. long. *Perianth* with tube about 5 lin. long; outer segments much deflexed; blade oblong- or almost obovate-elliptic, 2 in. long, 1 in. wide, brilliant dark purple-violet, velvety papillose, marked in the centre with golden yellow lines and streaks; claw linear-oblong, 1–1¼ in. long, reddish purple, finely dotted with golden yellow; inner segments erect, oblong, obtuse, narrowed below into a claw, altogether 2¼–2½ in. long, 4–5 lin. wide, dark purple-violet. *Style* with deep purple arms, their crests with ovate blunt lobes. *Stamens* with filaments about 8 lin. long, anthers 6 lin. long. *Ovary* 8 lin. long.

Fig. 1, flower-bud and spathes; 2 and 3, stamens; 4, stigma: *all enlarged except* 1, *which is of natural size.*

8434.

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TAB. 8434.

SAXIFRAGA LINGULATA.

Maritime Alps.

SAXIFRAGACEAE. Tribe SAXIFRAGEAE.

SAXIFRAGA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 635.

Saxifraga lingulata, *Bellardi, App. Fl. Pedem.* p. 20; *Engl. Monogr. Saxifraga,* p. 235; *Burnat, Fl. Alpes Marit.* vol. iii. p. 259; *Sprague in Kew Bull.* 1911, p. 129; rosulis foliorum polyphyllis, foliis longis linearibus acutis supra canaliculatis distincta.

Herba caudiculis rosulas polyphyllas gerentibus. *Folia* linearia (interdum subspathulato-linearia), acuta, 3–12 cm. longa, 3–5 mm. lata, rigida, recurva, supra canaliculata, inferne rubra, foveis intramarginalibus numerosis conspicue calcareo-incrustatis. *Panicula* suboblonga, multiflora; pedunculus 6–13 cm. longus, foliatus; bracteae oblongae, acutae, inferiores circiter 1·5 cm. longae, ceterae sursum gradatim minores. *Calyx* inferne minute glandulosus; lobi suberecti, oblongi, apice rotundati, 2·5 mm. longi, 1·5 mm. lati, glanduloso-ciliolati. *Petala* anguste obovata vel oblongo-obovata, 8 mm. longa, 3·5 mm. lata, alba, inferne ciliolata, purpureo-guttata, trinervia nervis lateralibus $\frac{1}{3}$ supra basin ortis. *Filamenta* subulata, oppositisepala 2·5 mm. longa, oppositipetala 2 mm longa. *Styli* breves, liberi, apice demum recurvi.—*S. callosa*, Smith in J. Dickson, Coll. Dried Pl. fasc. 3, no. 63, nomen prius.—T. A. SPRAGUE.

The subject of our plate is an old garden plant which has been grown for many years in the collection at Kew, where it is quite hardy. Perhaps the finest of the Silver Saxifrages, *S. lingulata* was discovered by Bellardi in the mountains of Piedmont towards the close of the eighteenth century, and was at first confused by most botanists with the Pyrenaean *S. longifolia*. Typical *S. lingulata* would appear to be all but confined to the Italian Maritime Alps. On the French side of the frontier its place is taken by a distinct variety, var. *lantoscana*, Engl., which has short, spathulate, very obtuse leaves and a unilateral panicle. In Central and Southern Italy it is again replaced by another distinct variety, var. *australis*, Engl., which has broader, more or less linear-spathulate leaves. These two varieties have sometimes been treated as specifically distinct from *S. lingulata* proper, but the identity of the three as regards

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floral characters and the existence of numerous intermediate forms—apart altogether from possible hybrids—render it inadvisable to separate them specifically. It is interesting to note that the high-level forms of var. *australis* from Naples and Sicily approach more closely to var. *lantoscana*, at the other extreme of the general specific area, than they do to the typical plant. Though hardy at Kew, the atmospheric conditions are adverse to the formation of good inflorescences in the open, and the plant shows to most advantage when given frame treatment and planted in a pot or pan of loam and powdered limestone. Away from the smoke of London, as for example in the garden of Miss Willmott, at Warley Place, Essex, this species is a success, planted on a rockery in a sunny position, where it thrives vigorously and forms a large clump. *S. lingulata* flowers in May.

DESCRIPTION.—*Herb*, with a rosulate many-leaved crown and a central flowering stem. *Leaves* linear or sometimes subspathulate-linear, acute, 1–5 in. long, $1\frac{1}{2}$–$2\frac{1}{2}$ lin. wide, rigid, recurved, channelled above, red near the base, with numerous marginal pits loaded with chalk. *Panicle* many-flowered, rather oblong; the flowering stem below the panicle 2–5 in. long, leafy; bracts oblong, acute, the lower about $\frac{1}{3}$ in. long, the rest gradually smaller upwards. *Calyx* finely glandular near the base; lobes suberect, oblong with rounded tips, over 1 lin. long, under 1 lin. wide, glandular-ciliolate. *Petals* narrow-obovate or oblong-obovate, 4 lin. long, under 2 lin. wide, white, ciliolate near the base and dotted with reddish-purple within, 3-nerved in the upper two-thirds. *Filaments* subulate, those opposite the sepals over 1 lin. long, rather longer than those opposite the petals. *Styles* short, free, ultimately recurved at the tip.

Fig. 1, leaves; 2, bract; 3, flower with petals removed; 4, petal; 5, stamen; 6, pistil; 7, sketch of an entire plant:—*all enlarged except* 1, *which is of natural size, and* 7, *which is much reduced.*

8435

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TAB. 8435.

HYPOCALYMMA ROBUSTUM.

West Australia.

MYRTACEAE. Tribe LEPTOSPERMEAE.

HYPOCALYMMA, *Schauer*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 702 (*Hypocalymna*).

Hypocalymma robustum, *Lindl. in Bot. Reg.* vol. xxix. t. 8; *Schauer in Linnaea,* vol. xvii. p. 241, *et in Lehm. Pl. Preiss.* vol. i. p. 110; *Benth. Fl. Austral.* vol. iii. p. 92; *De Wild. Ic. Hort. Then.* vol. vi. t. 235; ab *H. stricto,* **Schauer, cui affinis, floribus minoribus distinguendum.**

Suffrutex circiter unimetralis, glaber; ramuli stricti, virgati, cortice rubrobrunneo obtecti. *Folia* patentia, sessilia, crassa, linearia vel lineari-lanceolata, apice acuta, 1–2 cm. longa, sectione transversa ambitu plus minusve triangularia, ut in receptaculo sepalis petalisque pauci-glandulosa. *Flores* axillares, plerumque gemini, sessiles, sed nonnunquam 3–4-nati et pedunculo communi perbrevi validiusculo suffulti; bracteae bracteolaeque scariosae, circiter 2·5 mm. longae, 1–1·75 mm. latae, concavae. *Receptaculum* obconico-patelliforme, circiter 3·5 mm. diametro. *Sepala* oblongo-rotundata, ad 2·5 mm. longa et 2·25 mm. lata, scariosa. *Petala* puniceа, obovato-elliptica, 3·5 mm. longa, 3 mm. lata. *Stamina* 30–40, petala subaequantia, filamentis basi breviter connatis. *Stylus* 4 mm. longus; ovarium apice planum, 2-loculatum, 6-ovulatum.—*Leptospermum robustum,* **Endl. Hueg. Enum. p. 50.—W. G. CRAIB.**

The Swan River Peach Myrtle, which we here figure, is a West Australian plant that half a century ago was a favourite decorative pot-shrub in English conservatories, where it was grown along with species of *Boronia*, *Chorizema*, *Epacris*, and *Erica*. Now that the cultivation of hard-wooded greenhouse plants has fallen out of favour it is rarely seen in private collections. Out of doors it has always been somewhat difficult to grow, even in the most favoured parts of the United Kingdom, and the plant from which the material on which our plate is based was derived has the two-fold interest of being one which was grown in the open, though in a very sheltered position under a wall, in the garden of the late Mr. Gumbleton at Belgrove, Queenstown, and of being the last of the many contributions sent by that distinguished and successful gardener to

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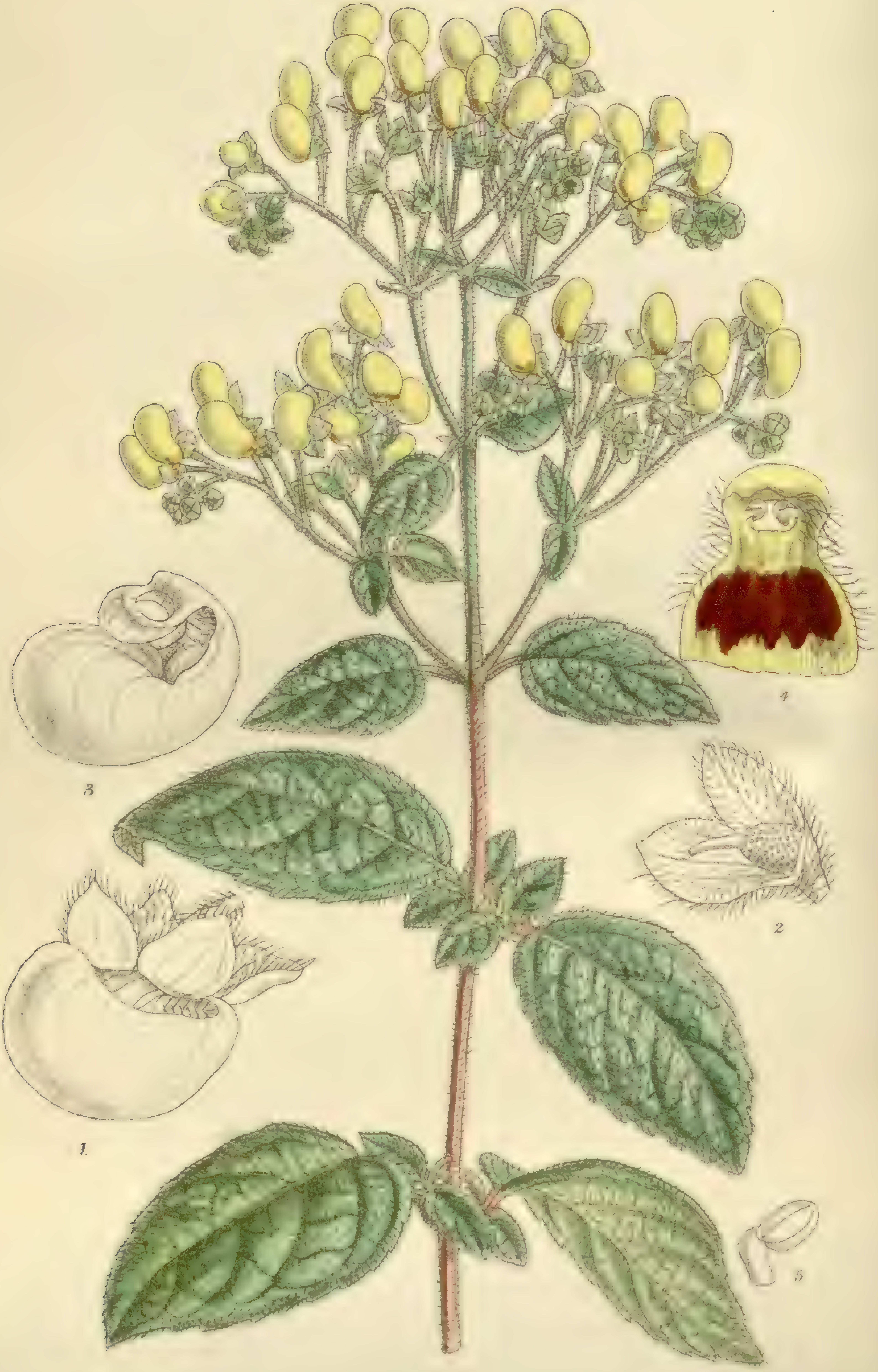
embellish the pages of this Magazine. In the garden at Belgrove it flowers in the month of February. The plants, which are now included in the genus *Hypocalymma*, were at first considered to belong to the genus *Leptospermum*, though they were treated by Endlicher as constituting a distinct section of the latter genus. To this section Lindley and Schauer simultaneously and independently accorded the rank of a distinct genus, and their decision has never been questioned since, though, owing to a typographical error which has found currency, the name in English garden lists has of late years usually been given as *Hypocalymna.*

DESCRIPTION.—*Undershrub*, 3–4 ft. high; twigs strict, virgate, glabrous; bark reddish-brown. *Leaves* spreading, sessile, thick, linear or linear-lanceolate, acute, $\frac{1}{2}$–$\frac{3}{4}$ in. long, more or less triangular in section, sparingly glandular. *Flowers* axillary, usually in pairs, sessile; sometimes 3–4-nate and then borne on a very short rather stout peduncle; bracts and bracteoles scarious, about 1 lin. long, nearly as wide, concave. *Receptacle* obconic patelliform, about 2 lin. wide. *Sepals* rounded oblong, scarious, about 1 lin. long and broad. *Petals* pink, elliptic obovate, nearly 2 lin. long, $1\frac{1}{2}$ lin. wide. *Stamens* 30–40, about as long as the petals; filaments shortly connate below. *Style* 2 lin. long; ovary flattened at the top, 2-celled, 6-ovuled.

Fig. 1, leaf; 2, flower-buds; 3, flower in longitudinal section; 4 and 5, stamens; 6, ovary in transverse section:—*all enlarged.*



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TAB. 8436.

CALCEOLARIA FORGETII.

Peru.

SCROPHULARIACEAE. Tribe CALCEOLARIEAE.

CALCEOLARIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 929; *Kränzl. in Engl. Pflanzenr. Scroph.-Antirrh.-Calc.* p. 21.

Calceolaria Forgetii, *Skan*; species *C. virgatae*, Ruiz et Pav. affinis, sed foliis longius petiolatis oppositis (nunquam ternatis), corollae labio infero erecto ad labium superum adpresso orificio minore et ungue breviore latioreque.

Suffrutex ad 4·5 dm. altus. *Caules* graciles, teretes, griseo-puberuli, cortice purpurascente; internodia 2·5–6·5 cm. longa. *Folia* ovata, 1·5–6 cm. (saepius 3–4 cm.) longa, 1–4 cm. (saepius 2–2·5 cm.) lata, obtusa vel subacuta, irregulariter crenato-serrata, basi rotundata vel paulum cuneata, supra saturate viridia, breviter pubescentia, infra pallidiora, venis primariis pubescentibus exceptis fere glaberrima, glandulis sessilibus instructa; petiolus 0·5–1·5 cm. longus, sat dense pilosus. *Cymae* subdichasiales caules et ramulos summos terminantes, paniculam laxam multifloram oblongam vel pyramidalem 1·5–2 dm. longam formantes. *Pedicelli* graciles, 5–12 mm. longi, sat dense breviter pubescentes. *Calyx* circiter 4 mm. longus, 4-lobus; lobi late ovati vel suborbiculares, subaequales, 3–3·5 mm. longi, 2·5–3 mm. lati, obtusi vel rotundati, integerrimi, extra et ad margines dense pilosi vel villosi, glandulis sessilibus instructi. *Corolla* 7–10 mm. longa, 5–8 mm. lata, pallide lutea, labio infero basi intra macula magna rubro-brunnea ornato, labiis basi ciliatis; labium superum calyci subaequilongum, cucullatum, basi 5 mm. latum; labium inferum obovoideo-globosum, 6–9 mm. longum, erectum, ad labium superum adpressum, vix usque ad medium apertum, ungui brevi latoque. *Stamina* corollae labio supero paulum longiora; filamenta parce pilosa. *Ovarium* ovoideum, densissime glanduloso-papillosum; stylus vix 2 mm. longus.—S. A. SKAN.

The pleasing Calceolaria here figured was presented to Kew in 1909 by Messrs. F. Sander & Sons, St. Albans, to whom seeds had been sent by Mr. Forget when collecting on their behalf in Peru. It forms a compact little shrub, and when out of flower has the aspect of a Heliotrope or of a bedding Verbena. When it flowered for the first time it was believed to be *C. virgata*, Ruiz & Pav., to which it is certainly closely allied, and under this name was referred to in the Gardeners' Chronicle, 1912, vol. li. p. 50, where a figure, reproduced from a photograph, is given. But, as Mr. Skan points out, the figure originally supplied by Ruiz and Pavon of their *C. virgata* (Fl. Peruv. vol. i. t. 31,

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fig. a) represents a plant with opposite or ternate subsessile leaves, and with a considerably diverse lip. No doubt the species now figured has been, in various collections, referred to *C. virgata*. The flowers of *C. Forgetii* are smaller than is usual in the genus and are not very conspicuous in colour; they are, however, very freely produced, and on this account impart a distinct horticultural value to the plant. They are remarkable from the fact that the pouched lower lip points upwards. At Kew plants placed in an open sunny border have grown well and flowered freely in summer, but have not withstood the winter in the open. Plants grown in pots in a greenhouse have, however, flowered almost as freely and proved equally attractive.

DESCRIPTION.—*Undershrub,* 1–1½ ft. high; stems slender, terete, grey pubescent with purplish bark; internodes 1–2½ in. long. *Leaves* ovate, ½–2¼ in., usually 1¼–1¾ in. long, ⅓–1¾ in., usually ¾–1 in. wide, obtuse or subacute, irregularly crenate serrate, base rounded or somewhat cuneate, dark green and shortly pubescent above, paler beneath and nearly glabrous, but beset with sessile glands except along the pubescent nerves and veins; petiole ⅙–½ in. long, rather closely hairy. *Cymes* at the ends of the stem and branches, forming an oblong or pyramidal lax many-flowered panicle 6–8 in. long. *Pedicels* slender, ¼–½ in. long, shortly but rather closely pubescent. *Calyx* about 2 lin. long, 4-lobed; lobes wide-ovate or suborbicular, subequal, 1½–2 lin. long, 1–1½ lin. wide, obtuse or rounded, quite entire, densely hairy or villous outside and on the margins, beset with sessile glands. *Corolla* 4–5 lin. long, 2½–4 lin. wide, pale yellow except for a large reddish brown blotch inside the lower lip; lips ciliate at the base, the upper cucullate about as long as the calyx, 2½ lin. wide at the base, the lower lip obovoid globose, 3–4½ lin. long, erect and adpressed to the upper lip, barely open as far as the middle, with a short broad claw. *Stamens* rather longer than the upper lip of the corolla; filaments sparingly hairy. *Ovary* ovoid, densely glandular papillose; style hardly 1 lin. long.

Fig. 1, flower; 2, calyx in section, showing pistil; 3, corolla; 4, basal portion of corolla showing the blotch within; 5, a stamen:—*all enlarged.*

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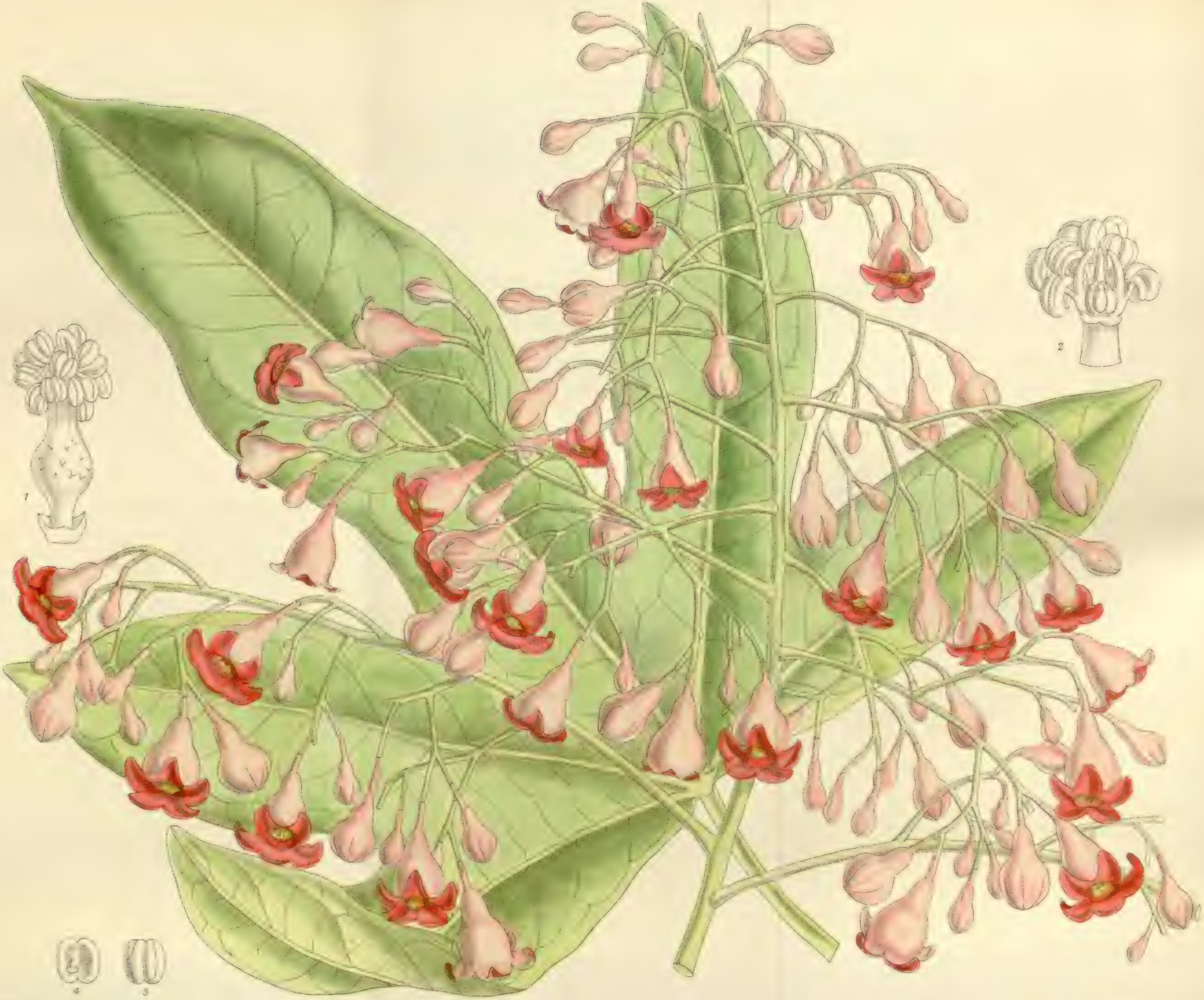

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Tab. 8437.

BRACHYCHITON ACERIFOLIUS.

Australia.

Sterculiaceae.

Brachychiton, *Schott et Endl.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 218, *pro sectione* Sterculiae; *K. Schum. in Engl. et Prantl. Nat. Pflanzenf.* vol. iii. 6, p. 96.

Brachychiton acerifolius, *F. Muell. Fragm.* vol. i. p. 1; vol. ii. p. 177; vol. v. p. 209; vol. vi. p. 173; *Second Census Austral. Pl.* p. 26; affinis *B. populneo*, R.Br., a quo foliis palmatim 5-lobis vel 7-lobis, necnon floribus glabris differt.

Arbor 18–30 m. alta, semidecidua, glabra. *Folia* longipetiolata, ambitu semielliptica vel suborbicularia, 20–25 cm. diametro, ultra medium palmatim 5–7-loba, basi plus minusve cordata, tenuiter coriacea, nitidula, creberrime reticulata, lobis ovato-oblongis interdum subtrilobis obtuse cuspidatis inferne angustatis; petioli 15–25 cm. longi. *Paniculae* axillares multiflorae, versus apices ramulorum aggregatae. *Flores* polygami, penduli, vivide coccinei. ♂ *Calyx* infundibulari-campanulatus, sub anthesi 12–15 mm. longus; lobi deltoidei, reflexi. *Petala* 0. *Stamina* perfecta circiter 15, ex apice gonophori medio incrassati et lacunosi orta; filamenta inferne in tubum plus minusve connata, 5 interiora longiora, ananthera, carpella 5 rudimentaria circumdantia. ♀ *Calyx* maris. *Petala* 0. *Gonophorum* breve, incrassatum. *Stamina* maris. *Carpella* 5; ovaria libera, oblonga, papillata; styli inferne liberi, superne connati; stigmata in unum quinquelobatum connata. *Folliculi* magni, longe stipitati, glabri.—*Sterculia acerifolia*, A. Cunn. in Loudon, Hort. Brit. p. 392, partim; Benth. Fl. Austr. vol. i. p. 229; Moore & Betche, Handb. Fl. N. S. Wales, p. 62; Bailey, Queensl. Fl., pars 1, p. 138; Guilfoyle, Australian Plants, pp. 341, 408.—T. A. Sprague.

The Flame Tree, for such is the name given in Queensland and New South Wales to the species which forms the subject of our plate, is a tree which attains, in its native forests, a height of from sixty to a hundred and twenty feet, with a trunk three feet through; it yields a soft light-coloured wood. According to Loudon the species was first introduced into England in 1824, and there is a drawing in the collection at Kew made from a plant growing in the Royal Gardens in 1826. This drawing bears a note to the effect that the plant was introduced from New South Wales in 1825. In the garden of Lady Hanbury at La Mortola, Ventimiglia, *B. acerifolius* thrives in the open air, but at Kew it can only be grown under glass, and the material for our illustration has been obtained from a plant which is

June, 1912.

grown in one of the beds in the central portion of the Temperate House, and is now a tree about forty feet high. This plant has been in cultivation at Kew since 1862, when it was presented to the national collection by Messrs. J. Veitch & Sons, Chelsea. Under cultivation in a greenhouse the species is easily kept in health, but it evidently requires abundant sunshine to induce it to flower, which the Kew plant did for the first time in June 1910. Already two other species of this genus have been figured in this work; *B. Bidwillii*, Hook., at t. 5133, and *B. discolor*, F. Muell. at t. 6608.

Description.—*Tree*, 60–120 ft. in height, semideciduous, glabrous. *Leaves* long-petioled, semi-elliptic or suborbicular, 8–10 in. across, palmately 5–7-partite, the base more or less cordate, thinly coriaceous, shining, closely reticulated; lobes ovate-oblong, sometimes slightly 3-lobed, bluntly cuspidate, narrowed downwards; petiole 6–10 in. long. *Panicles* axillary, many-flowered, clustered towards the ends of the twigs. *Flowers* polygamous, pendulous, bright pink. ♂ *Calyx* narrow campanulate, 6–7 lin. long when in flower; lobes deltoid, reflexed. *Petals* absent. *Stamens* about 15 perfect, attached at the tip of a gonophore thickened and spongy at the middle; filaments more or less connate below in a tube, the 5 inmost longer than the rest and without anthers, surrounding 5 rudimentary carpels. ♀ *Calyx* as in the male. *Petals* absent. *Gonophore* short and stout. *Stamens* as in the male. *Carpels* 5; ovaries free, oblong, papillate; styles free below, connate above; stigmas united in a 5-lobulate head. *Follicles* large, long stipitate, glabrous.

Fig. 1, gonophore and stamens; 2, section showing stamens and rudimentary carpels; 3 and 4, anthers:—*all enlarged.*

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TAB. 8438.

RUPICOLA SPRENGELIOIDES.

Australia.

EPACRIDACEAE. Tribe EPACRIDEAE.

RUPICOLA, *Maid. in Proc. Linn. Soc. N.S. Wales*, vol. xxiii. (1898), p. 774.

Rupicola sprengelioides, *Maid.*, **l.c. p. 775; species unica.**

Frutex ad 0·75 m. altus, ramis virgatis tenuiter pubescentibus dense foliatis. *Folia* lineari-lanceolata, obtusiuscule acuminata, basi in petiolum brevissimum contracta, 1·5–2, ex autore ad 3 cm. longa, 2–3 mm. lata, rigida, subevenia. *Flores* in foliorum axillis solitarii, plerumque ab ramorum apicibus remoti, quasi in racemum multiflorum foliatum superne sterilem congesti; pedicelli graciles, bracteati, ad 1 cm. longi, tenuiter puberuli; bracteae 12–16 secundum pedicellum dispositi, sursum accrescentes, inferiores ovato-oblongae, superiores lanceolatae, summae acuminatae et sepalis similes nisi breviores. *Sepala* persistentia, anguste lanceolata, acuminata, 5–6 mm. longa, pallide viridia, anguste albo-marginata. *Corolla* subrotata, fere 1·5 cm. diametro, lactea; tubus vix 1 mm. longus; segmenta ovata, subacuta, 6 mm. longa, 2·5–3 mm. lata. *Filamenta* 1·5 mm. longa, papillosula; antherae aequilongae, 1-loculares, ab apice rima una dehiscentes. *Discus* obscurus. *Ovarium* glabrum; stylus 3·5 mm. longus, filiformis; stigma stylo vix latius. *Capsula*, e specimine spontaneo, globosa, 2 mm. diametro, loculicide dehiscens. *Semina* oblique ovoidea, 0·6–0·7 mm. longa.—O. STAPF.

The interesting Epacrid which forms the subject of our plate was discovered by Messrs. J. H. Maiden and W. Forsyth near the southern edge of the King's Tableland in the Blue Mountains of New South Wales in 1898, and was first described by Mr. Maiden in the same year. To Mr. Maiden horticulture is further indebted for its introduction to this country, and the plant from which the material for our figure was obtained is one raised from seed sent by him to Kew in 1906. The structure of the anthers appeared to Mr. Maiden, when first describing the plant, to render its position among the *Epacrideae* somewhat obscure, but on account of the general agreement of the species with the genus *Epacris* itself as regards foliage, Mr. Maiden placed *Rupicola* next to *Epacris*. In this, as it now appears, the author was fully justified, since *Rupicola* is found to agree with *Epacris* as regards its anthers. With the species of *Epacris*, *Rupicola* further agrees in the matter of cultural requirements, and when treated as they are treated it forms

JUNE, 1912.

shapely little shrubs, some of which flowered freely for the first time in April 1911.

DESCRIPTION.—*Shrub*, 2½ ft. high; branches virgate, thinly pubescent, densely leafy. *Leaves* linear-lanceolate, somewhat bluntly acuminate, narrowed at the base into a very short petiole, ⅔–¾ in. or, in wild plants, sometimes over 1 in. long, 1–1½ lin. wide, rigid, inconspicuously veined. *Flowers* solitary in the leaf-axils, usually some distance below the tips of the twigs, and thus simulating a leafy many-flowered raceme with a barren apex; pedicels slender, bracteate, 4–5 lin. long, thinly puberulous; bracts 12–16 to a pedicel uniformly disposed throughout its extent but increasing in size upwards; the lowest ovate-oblong, those above lanceolate, the uppermost acuminate and resembling the sepals but rather smaller. *Sepals* persistent, narrow lanceolate, acuminate, 2½–3 lin. long, pale green with narrow white margins. *Corolla* subrotate, almost ⅓ in. across, milky-white; tube barely ½ lin. long; segments ovate, subacute, 3 lin. long, 1–1½ lin. wide. *Filaments* under 1 lin. long, finely papillose, anthers subequal, 1-locular, dehiscing from the tip by a single chink. *Disk* obsolete. *Ovary* glabrous; style under 2 lin. long, filiform; stigma hardly wider than the style. *Capsule*, in wild specimens, globose, 1 lin. across, opening loculicidally. *Seeds* obliquely ovoid, very small.

Fig. 1, leaves; 2, bracts and flower; 3, corolla, laid open; 4 and 5, anthers; 6, transverse section of an anther; 7, pistil; 8, transverse section of an ovary; 9, vertical section of an ovary; 10, fruit; 11, fruit, two sepals removed; 12, seed:—*all enlarged except* 10, *which is of natural size.*

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Tab. 8439.

IXORA lutea.

Garden Origin.

Rubiaceae. Tribe **Ixoreae.**

Ixora, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 113.

Ixora lutea, *Hutchinson*; affinis *I. coccineae*, Linn., sed inflorescentia laxiore, floribus ochroleucis, corollae lobis ovato-rhomboideis abrupte mucronulatis differt.

Frutex erectus, vix 1 m. altus; rami juniores minute puberuli, demum glabri. *Folia* oblongo-elliptica, apice conspicue mucronata, basi paullo inaequaliter cordata, 7–9 cm. longa, 4–5 cm. lata, tenuiter chartacea, margine leviter recurvata, utrinque glabra, pallida, nervis lateralibus utrinque circiter 10 patulis intra marginem anastomosantibus subtus prominulis, venis laxis utrinque distinctis; petioli crassi, 1·5 mm. longi, minute puberuli; stipulae e basi lato longe subulatae, 7–10 mm. longae, basi circiter 5 mm. latae, glabrae. *Corymbi* laxiflori, circiter 12 cm. expansi; rami primarii ad 2 cm. longi, minute puberuli; bracteae triangulari-subulatae, acutae, 1·5–2 mm. longae. *Flores* ochroleuci, sessiles. *Receptaculum* 1·5 mm. longum, puberulum. *Calycis* lobi 4, late ovati, subacuti, 1·75 mm. longi, 1·5 mm. lati, coriacei, margine leviter membranacei et interdum paucidentati, extra minute puberuli, intra basi pectinatim multiglandulosi. *Corollae* tubus cylindricus, 3·5 cm. longus, vix 1 mm. diametro, extra glaber; limbus 3 cm. expansus; lobi 4, ovato-rhomboidei, mucronulati, 1·3–1·7 cm. longi, 0·5–0·8 cm. lati, glabri. *Antherae* subsessiles, exsertae, 4 mm. longae, acute acuminatae. *Ovarium* 2-loculare; stylus gracilis, glaber, paullo exsertus, ramis leviter recurvatis intra complanatis 2 mm. longis.—*Ixora coccinea* var. *lutea*, Hort. ex Veitch Cat. Indoor Pl. 1910, p. 47.—J. Hutchinson.

The beautiful *Ixora* here figured is one that has been in cultivation at Kew for at least a couple of decades. It was originally received from the Royal Botanic Garden, Peradeniya, Ceylon, under the garden name *I. coccinea*, var. *lutea*, and under this name it is now to be met with in many private collections and in various nursery catalogues. It is certainly, as this garden name implies, most nearly allied to *I. coccinea*, figured long ago at t. 169 of this work. But it is readily distinguished from *I. coccinea*, not only by the colour of its flowers, but by its more lax inflorescence and by the larger ovate-rhomboid corolla lobes, though in habit and foliage it bears a close general resemblance to the various named forms of *I. coccinea* in cultivation. Like these

June, 1912.

other garden Ixoras, *I. lutea* is easily cultivated under moist tropical conditions, and like them, when in flower, is an exceedingly attractive plant.

Description.—*Shrub*, 2–3 ft. high, erect; young twigs at first finely puberulous, at length glabrous. *Leaves* oblong-elliptic, distinctly mucronate, base somewhat unequally cordate, 3–3½ in. long, 1¾–2 in. wide, thinly papery, margin slightly recurved, pale green, glabrous on both surfaces, lateral nerves about 10 on each side of the midrib, spreading, looping within the margin, raised beneath, secondary venation lax, distinct both above and below; petiole stout, 7–8 lin. long, finely puberulous; stipules long subulate from a wide base, 4–5 lin. long, about 2½ lin. wide at the base, glabrous. *Corymbs* lax-flowered, about 2½ in. across; main branches up to ¾ in. long, finely puberulous; bracts triangular-subulate, acute, about 1 lin. long. *Flowers* pale yellow, sessile. *Receptacle* under 1 lin. long, puberulous. *Calyx* 4-lobed; lobes wide ovate, subacute, under 1 lin. long, nearly as wide, coriaceous, their margins membranous and at times sparingly toothed, finely puberulous outside, pectinately glandular at the base within. *Corolla* 4-lobed; tube cylindric, 1½ in. long, very slender, glabrous outside; limb about 1 in. across; lobes ovate-rhomboid, mucronulate, 6–8 lin. long, 2½–4 lin. wide, glabrous. *Anthers* almost sessile, exserted, 2 lin. long, acutely acuminate. *Ovary* 2-celled; style slender, glabrous, shortly exserted, its arms 1 lin. long, slightly recurved and flattened on the inner face.

Fig. 1, calyx and pistil; 2, section of calyx and ovary; 3 and 4, stamens:—*all enlarged.*

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TAB. 8440.

LYCIUM PALLIDUM.

Southern United States and Northern Mexico.

SOLANACEAE. Tribe ATROPEAE.

LYCIUM, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 900.

Lycium pallidum, *Miers in Ann. and Mag. Nat. Hist.* ser. 2, vol. xiv. p. 131 (1854); species *L. carolinianum,* Walt., simulans, corollae tubo longiori filamentisque glabris recedit.—*Miers, Ill. S. Amer. Pl.* vol. ii. p. 108, t. 67, fig. C; *Torrey, Bot. Mex. Bound. Surv.* p. 154; *A. Gray in Proc. Amer. Acad.* vol. vi. p. 45, *et in Syn. Fl. N. Amer.* vol. ii. pars i. p. 238; *Gard. & For.* 1888, p. 341, fig. 54; *Mitt. Deutsch. Dendr. Ges.* 1906, p. 38; *Gard. Chron.* 1909, vol. xlvi. p. 232, cum ic.

Frutex ramosus; ramuli tortuosi, brunnei, dense foliosi, spinis rectis instructi. *Folia* ad nodos incrassatos fasciculata, oblanceolata, obtusa, in petiolum brevem contracta, usque ad 3 cm. longa, 8 mm. lata, glauca, subcarnosa, venis obscuris. *Flores* solitares vel geminati; pedicelli 4 mm. longi, glabri. *Calyx* pedicello paullo brevior, poculiformis, carnosus, glaber; lobi 5, tubo aequilongi, obtusi vel subacuti. *Corolla* pallidissime lutea vel fere alba, basi carneo-tincta, 2 cm. longa; tubus infra cylindricus, superne infundibuliformis; lobi 5, rhomboideo-ovati, obtusi, 5 mm. longi. *Stamina* 5, subaequilonga, exserta; filamenta paullo supra medium tubi corollae inserta, pars libera glaberrima, pars adnata pilosa; antherae ovatae, cordatae. *Stylus* filiformis, longe exsertus; stigma clavatum, leviter bilobum. *Bacca* globosa, 7 mm. diametro, coccinea.—*L. Schaffneri,* A. Gray ex Hemsl. in Biol. Centr. Amer. Bot. vol. ii. p. 426.—C. H. WRIGHT.

The *Lycium* which forms the subject of our illustration is the most distinct and, as a flowering shrub, the most effective species of the genus in cultivation. It was first discovered by Fremont in 1844 on the Rio Virgen, one of the tributaries of the Colorado River, where it forms a small bush 2–3 feet in height. There are, as Dr. Asa Gray has pointed out, two distinguishable forms of *L. pallidum*; one of these, which is the form figured by Miers, was collected by Fendler in New Mexico, and has the corolla-tube quite glabrous inside; the other, from Colorado, which is that now figured, while agreeing with the New Mexican form in all other respects, has the corolla-tube hairy inside below the insertion of the stamens. This form, which has been in cultivation in the open at Kew since 1886, blossoms freely every year from the end of May until mid-June, its slender spreading branches being gracefully wreathed from base to tip with pendent, pale-greenish, purple-tinged flowers. But until 1911 not one of the examples in the Kew collection ever developed a fruit; in that summer, doubtless owing to the prolonged and excessive heat, an abundant crop of berries was produced. These, being of a bright red colour, rendered the plants most attractive during July and August. Hitherto the species has been propagated by layering, cuttings having proved difficult to strike. Doubtless this method of increase will still, as a rule, require to be adopted; it may be long ere another crop of fruits is borne. A loamy, well-drained soil, of a light rather than heavy yet by no means too light character, suits it best, and it must be given the sunniest position available.

Description.—*Shrub*, 3–4 ft. high, much branched; branches spreading, brownish, densely leafy, armed with straight spines. *Leaves* clustered on the thickened nodes, oblanceolate, obtuse, narrowed to a short petiole, 1–1¼ in. long, ⅓ in. wide, glaucous, somewhat fleshy, obscurely veined. *Flowers* solitary or in pairs; pedicels 2 lin. long, glabrous. *Calyx* rather shorter than the pedicel, cup-shaped, fleshy, glabrous; lobes 5, as long as the tube, obtuse or somewhat acute. *Corolla* pale greenish-yellow or almost white, purplish-pink at the base, ¾ in. long; tube cylindric below, funnel-shaped above; lobes 5, rhomboid-ovate, obtuse, 2½ lin. long. *Stamens* 5, nearly equal, exserted; filaments attached slightly above the middle of the corolla-tube, their free portion glabrous, that below the attachment pilose; anthers ovate-cordate. *Style* filiform, far exserted; stigma clavate, slightly 2-lobed. *Berry* globose, red, ¼–⅓ in. across.

Fig. 1, calyx and pistil; 2, corolla, laid open, and stamens; 3 and 4, anthers; 5, ovary; 6, vertical section of the same:—*all enlarged.*

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M. S. del. J. N. Fitch lith.

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TAB. 8441.

PEROVSKIA ATRIPLICIFOLIA.

Afghanistan to Western Tibet.

LABIATAE. Tribe MONARDEAE.

PEROVSKIA, *Karel.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1193 (*Perowskia*).

Perovskia atriplicifolia, *Benth. in DC. Prodr.* vol. xii. p. 261; *Boiss. Fl. Orient.* vol. iv. p. 589; *Aitchison in Journ. Linn. Soc.* vol. xviii. p. 86; *Hook. f. Fl. Brit. Ind.* vol. iv. p. 652; *André in Rev. Hort.* 1905, p. 344, cum tab. col. (omnes sub nomine *Perowskia*); species *P. scrophulariaefoliae*, Bunge, arcte affinis, sed caulibus brevissime stellato-tomentosis incanis, foliis basi multo angustioribus differt.

Frutex, 1–1·5 m. altus. *Caules* erecti, stricti, teretes, brevissime stellato-tomentosi, incani, superne ramosi. *Folia* ovato-lanceolata vel lanceolata, majora 4–6 cm. longa et 1·2–2·5 cm. lata, subacuta, irregulariter serrata vel inciso-serrata, basi gradatim angustata, primo plus minusve pilis simplicis vel stellatis vestita, demum fere glabrescentia, utrinque resinoso-glandulosa, subtus venis primariis prominentibus; petiolus 0·5–1·5 cm. longus. *Inflorescentia* paniculiformis, 3–5 dm. longa, ramulis numerosis strictis gracilibus spiciformibus. *Verticillastri* numerosissimi, 2–6-flori, plus minusve dissiti. *Bracteolae* anguste ovatae vel lanceolatae, calyce breviores. *Flores* sessiles vel brevissime pedicellati. *Calyx* tubulosus, 3–4 mm. longus, leviter 2-labiatus, dense albo-hirsutus, resinoso-glandulosus; labium superum inaequaliter 3-dentatum; labium inferum 2-dentatum; dentes deltoidei, acuti, 0·5–1 mm. longi. *Corolla* coerulea, circiter 1 cm. longa, parce pilosa; tubus tubuloso-infundibuliformis, 5–6 mm. longus, intus oblique annulato-pilosus; limbus patens, planus, 2-labiatus; labium superum 4-lobum, 4–5 mm. longum, 8 mm. latum, lobis ovatis vel suborbicularibus, 1·5–2 mm. longis 1·25–2·5 mm. latis; labium inferum indivisum, elliptico-ovatum, 3–4 mm. longum, 3 mm. latum. *Stamina* 4, 2 postica minima, sterilia, inclusa, 2 antica fertilia, subinclusa vel longe exserta. *Nuculae* obovoideae, basi disco leviter denticulato cinctae. *Stylus* inclusus vel exsertus.—S. A. SKAN.

The Labiate genus *Perovskia*, to which the plant here figured belongs, is a somewhat anomalous one, comprising four species, two of which are natives of Turkestan with a third confined to Beluchistan, and a fourth, the one now depicted, which extends from the mountains of Afghanistan through the Western Himalaya to Western Tibet. In the Karakoram Range it is met with at elevations up to 10,000 feet above sea level. Dr. Aitchison has reported it as plentiful in certain parts of the Kuram Valley, and described it as being singularly striking when in flower. The flowers in Afghanistan are usually lavender-coloured,

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but are occasionally pure white; the plant has an odour closely resembling that of *Salvia officinalis*. The plant from which the material for our plate has been obtained is one that was procured for the Kew collection in 1906 from Messrs. Bees, Limited. Under cultivation it retains the features attributed to it in the wild state by Aitchison; its chief value as a garden plant lies in the abundant and very pleasing display of blossom which it provides in August and September when few shrubby species are to be had in flower. The silvery grey of the stems and flower-stalks affords an admirable contrast with the rich violet-blue of the corollas. The flowers are produced in a large panicle, 1–1½ ft. high, terminating the current season's growth. Much of the upper part of this growth is soft and dies off in winter; the plant should therefore be pruned back to the woody portion of the stem and branches every spring. Like most of the Labiate family, it is easily increased by cuttings of young wood, made about July and placed in gentle heat. *P. atriplicifolia* thrives well in a deep but not heavy loam. There has been some dubiety as to the exact natural position of the genus, mainly perhaps owing to the fact that both Karelin and Bentham have described as the upper lips of the calyx and corolla what in reality are the lower. Bunge, who pointed out this misapprehension in 1851, has shown that the corolla is almost identical in structure with that of some of the *Ocimoideae*. The flowers are dimorphic; sometimes, as in our figure, with short stamens and an exserted style, sometimes with an included style and with exserted fertile stamens.

DESCRIPTION.—*Shrub*, 3–5 ft. high. *Stem* erect, strict, terete, shortly stellate-tomentose hoary, branching upwards. *Leaves* ovate-lanceolate or lanceolate, the largest 1½–2¼ in. long, ½–1 in. wide, subacute, irregularly serrate or incised, gradually narrowed to the base, at first more or less covered with simple or stellate hairs, at length nearly glabrous, resinously glandular on both surfaces with rather raised main-nerves beneath; petiole ¼–½ in. long. *Inflorescence* paniculate, 1–1½ ft. long, with numerous strict, slender, spiciform branches; whorls very numerous, 2–6-flowered, more or less segregated; bracteoles narrow-ovate or lanceolate, shorter than the calyx. *Flowers* sessile or very shortly pedicelled. *Calyx* tubular, 1¼–2 lin. long, slightly 2-lipped, densely white tomentose, resinously glandular; upper lip unequally 3-toothed, lower 2-toothed; teeth deltoid, acute, very short. *Corolla* blue, about 5 lin. long, sparingly hairy; tube somewhat funnel-shaped, 2½–3 lin. long, with an oblique ring of hairs within; limb spreading, flat, 2-lipped; upper lip 4-lobed, 2–2½ lin. long, 4 lin. wide, the lobes ovate or suborbicular; lower lip entire, elliptic-ovate. *Stamens* 4; the two upper very small, sterile, included; the two lower fertile, sometimes almost included, sometimes far exserted. *Style* exserted or included. *Nutlets* obovoid, surrounded at the base by a somewhat lobed disk.

Fig. 1, flower; 2, calyx and pistil; 3, corolla, laid open; 4 and 5, anthers; 6, ovary and disk:—*all enlarged.*

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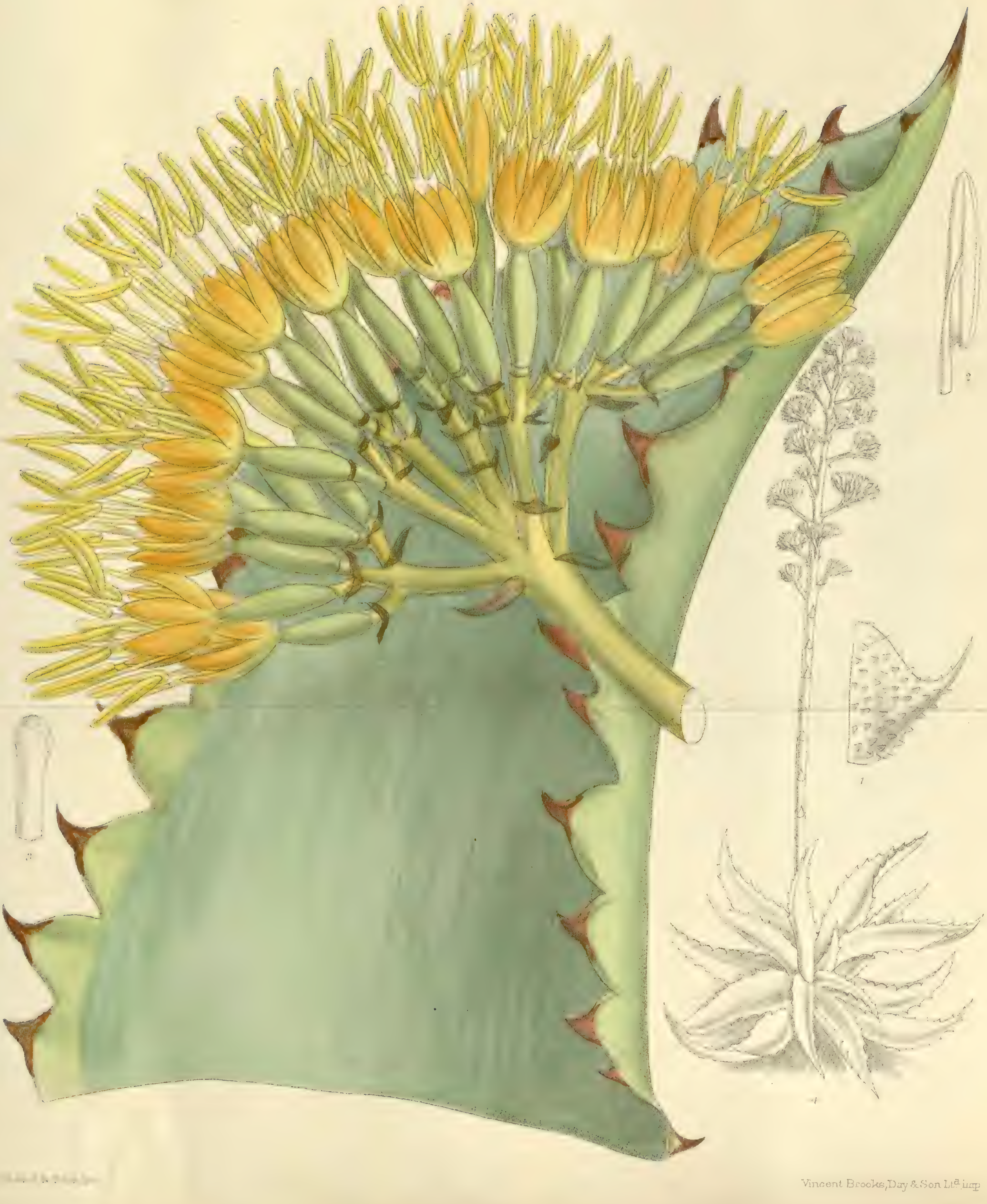

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TAB. 8442.

AGAVE MARMORATA.

Mexico.

AMARYLLIDACEAE. Tribe **AGAVEAE.**

AGAVE, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 733.

Agave (Euagave) marmorata, *Roezl in Belg. Hort.* 1883, p. 238; *Baker Handb. Amaryll.* p. 179; a speciebus ceteris subsectionis *Americanae* nuncupatae differt foliis glaucissimis asperrimis floribusque parvis jucunde luteis.

Frutex acaulis, rosula simplex usque 2 m. diametro et 1 m. fere alta, foliis circiter 30 eleganter patenti-recurvis composita. *Folia* lanceolata, 1·05–1·1 m. longa et 25–27 cm. supra medium lata, basin versus ad 14 cm. angustata, basi biconvexa 6–8 cm. crassa praesertim subtus carinato-convexa, a medio marginibus incurvis subundulatis late et profunde canaliculata, glauca vel caesia, defloratione tantum viridescentia, utrique—praesertim subtus—asperrima, a basi usque apicem repando-dentata, aculei validi, irregulares, deltoideo-cuspidati, cornei, brunnei, asperi, basi carnosae deltoideae vel ovatae insidientes, sinubus profundis rotundatis vel acutis separati, majores 20–50 mm. distantes et 15–20 mm. longi saepissime minoribus interjectis, inferiores et summi sensim minores ex margine recto vix repando; spina terminalis 20 mm. longa, griseo-brunnea, subulata, haud decurrens, asperrima. *Inflorescentiae* 3·75 m. altae; pedunculus pro rata plantae paullum robustus, 1·95 m. altus, viridis, basi bracteis foliaceis paucis munitus, superne bracteis vacuis deltoideis acuminatis scariosis circiter 15–16 cm. longis remotis onustus; panicula oblongo-cylindracea, circiter 1·8 m. longa et 55 cm. lata, ramis circiter 26 erecto-patentibus apice tripartitis majoribus 25 cm. longis; flores dense aggregati, parvi, jucunde lutei. *Pedicelli* brevissimi; bracteae minutae, deltoideae, mox siccantes. *Perianthii* segmenta campanulato-conniventia, erecta, basi tantum in tubum brevem connata, apice mox siccantia, carnosula, laete lutea, exteriora ovato-lanceolata, acutiuscula, dorso convexa, intus late canaliculata, 16–18 mm. longa et 6 mm. lata, interiora breviora, obtusiora et latiora, dorso carinata, intus profunde canaliculata; stamina imo basi tubi affixa, filamenta lutea inaequalia, 3–3·5 cm. longa, antherae 16 mm. longae, luteae. *Ovarium* 20–22 mm. longum, 6 mm. latum, laete et nitide viride, subtrigono-cylindraceum utrinque attenuatum, sub tubo 6-sulcatum; stylus demum 35 mm. longus, luteus, stigma subtrilobum capitatum.—A. BERGER.

Agave marmorata was collected by Roezl in the Province of Tehuacan, Mexico, and has since then been rather rare in collections. Of two plants in the garden of the late Sir T. Hanbury at La Mortola, Ventimiglia, under this name, in 1901, one poled in autumn 1904. The scape was damaged by frost during the following winter, and it produced from the stump a large number of bulbils, by

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means of which it has been propagated and distributed. Other plants identical with these have been received since at La Mortola from the Botanic Gardens in Palermo and Paris under the name of *A. asperrima*. One of the plants derived from the original specimen flowered at La Mortola in June, 1911, and provided the material on which our figure is based. Our plant agrees well with the description of *A. marmorata* given by Baker in his Handbook of the Amaryllideae, p. 179; his remark, "between *A. Scolymus* and *A. americana*," well expresses its characters. The leaves are glaucous, almost white, and only become greener in dying off on the flowering plant. They are extremely rough, especially on the underside and near the point; the marginal and end spines are also tubercular and rough. The Indians are said to make use of the leaves in veterinary medicine.

The position of *A. marmorata* is not altogether clear. From the leaves it might be considered a member of the *Americanae* of Baker, but the small bright yellow flowers preclude this and suggest a closer affinity to the species allied to *A. Willdingii*, Tod., though here again *A. marmorata* differs as regards the arrangement of its flowers on the branches.

DESCRIPTION.—*Shrub*; stem 0; rosette simple, without suckers or offshoots, 2 yards in diameter and 1 yard high, with about thirty leaves. *Leaves* spreading from the base, recurved from the middle and with a slightly inflexed tip, lanceolate or oblanceolate-spathulate, 40–44 in. long, above the middle 10–11 in. broad, hence gradually narrowed to a channelled point ending in a conical, greyish brown, very rough spine, ¾ in. long, not decurrent; constricted towards the base and about 5½ in. broad at the neck, about 3 in. thick at the base, convex on both sides, but very markedly and almost broadly keeled on the underside, gradually thinner above, broadly channelled and with the margins erect and somewhat undulate, much repand between the large irregular spines, very glaucous or almost white or with a bluish tint, becoming paler and greener only before decaying, very rough everywhere, especially on the underside and near the top; marginal spines from a broad horny base, cuspidate-uncinate, brown, rough, rising from a broad ovate or deltoid fleshy cushion of the leaf margin, ¾–2 in. distant and 7–8 lin. long, separated by a roundish or acute sinus; the lower and higher marginal spines gradually smaller and the edge not repand between them. *Inflorescence* about 12 ft. high; scape relatively slender, about 6 ft. long, green, smooth, with several deltoid acuminate scarious empty bracts, 2½–6 in. long, and a few leaf-like bracts at its base; panicle oblong-cylindric, about 6 ft. long and 22 in. broad, with about twenty-six spreading branches, the longest 10 in. long; flowers in dense clusters, bright yellow, with a somewhat unpleasant smell, rather small, 1½ in. (including the style 2½ in.) long. *Pedicels* short, bracts minute, soon drying. *Perianth-segments* united at their base into a short tube, erect, campanulate, fleshy, bright yellow, soon withering at the top; the outer ones ovate-lanceolate, acute, 8–9 lin. long and 3 lin. broad, convex on the back and broadly channelled inside, the interior shorter, more obtuse and broader, with a fleshy keel at the back and a deep furrow inside. *Stamens* yellow, filaments inserted at the base of the tube, erect, unequal, 15–17 lin. long; anthers yellow, 8 lin. long. *Ovary* bright and glossy green, subtrigonous or subcylindric, tapering at both ends and below the tube shortly 6-furrowed, 10–11 lin. long and 2½–3 lin. broad; style ultimately over 1¼ in. long, yellow, somewhat thickened at the obscurely 3-lobed stigma.

Fig. 1, spine from leaf-margin; 2, anther; 3, stigma; 4, sketch of entire plant, from photographs:—*all enlarged except 4, which is much reduced.*

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TAB. 8443.

ERICA CILIARIS.

South-western Europe.

ERICACEAE. Tribe ERICEAE.

ERICA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 590.

Erica ciliaris, *Linn. Sp. Pl. ed.* 1, p. 354; *Bot. Mag.* t. 484; *Benth. in DC. Prodr.* vol. vii. p. 665; *Syme, English Botany*, ed. 3, vol. vi. p. 36, t. 887; affinis *E. Tetralici*, Linn., sed floribus racemosis, corolla obliqua et antheris muticis facile distinguitur.

Frutex nanus, ramosissimus; rami glanduloso-pubescentes. *Folia* 4-na, patula vel subreflexa, brevissime petiolata, 1·5–5 mm. longa, 0·75–2 mm. lata, ovata, ovato-oblonga vel lineari-lanceolata, acuta, basi rotundata, marginibus revolutis et pilis longis glanduliferis ciliatis, glabra. *Flores* ad apices ramorum racemosi, foliis redactis bracteati. *Sepala* 3–3·5 mm. longa, folia simulantia. *Corolla* nutans, 1 cm. longa, oblique ovato-urceolata, glabra, pulchre purpurea. *Stamina* inclusa; antherae oblongae, muticae. *Ovarium* glabrum.—*E. Maweana*, Backhouse in Florist and Pomologist, 1882, p. 75.—N. E. BROWN.

The beautiful hardy Heath, *Erica ciliaris*, is a member of the interesting contingent of British species which elsewhere find a home in south-western Europe. This species in the United Kingdom is, in a wild state, to be met with only in the counties of Dorset, Cornwall and Galway. It extends thence to France, and is most plentiful in Portugal and Spain. An old garden plant, *Erica ciliaris* was figured in this work at t. 484 more than a century ago and that figure affords a satisfactory idea of the species as met with in the British Islands, in France, and in Spain. But in Portugal, besides the ordinary form, there is another which, while it cannot be discriminated by any salient morphological character even as a variety, is from the cultural standpoint so distinct and striking as to deserve a place in our pages. For the earliest record of this form and for its introduction to horticulture we are indebted to the late Mr. G. Maw, who met with it in Portugal in 1872. It at once attracted the attention of the late Mr. J. McNab, who in a note written in 1875 calls attention to the fact that Mr. Maw's plant has a more compact habit of growth and

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that its flowers are not secund as in *E. ciliaris* proper. Ten years later this striking form was reintroduced, and in 1882 it was described by Mr. Backhouse as *E. Maweana.* The plants of the earlier introduction had by this time been almost lost to cultivation. Fortunately, however, some were preserved by Messrs. Cunningham and Fraser in their nursery at Edinburgh, and plants were purchased from them for Kew a number of years ago. Since then it has been largely propagated by cuttings and planted in masses in various parts of the grounds; these from July till October give bright displays of rich colour. For soils that are free from lime Mr. Maw's Heath may be recommended as perhaps the showiest of the late-flowering sorts, and while even its most ardent admirer will agree that it is not desirable to follow Mr. Backhouse in considering it a species apart from *E. ciliaris*, there is no doubt that the ordinary lover of flowers must feel that formal system is subject to some degree of limitation since it is found impossible to accord separate botanical recognition of any kind to this pleasing and striking plant.

DESCRIPTION.—*Shrub*, dwarf, much branched; branches glandular, pubescent. *Leaves* 4-nate, spreading or subreflexed, shortly petioled, 2½ lin. long or shorter, 1 lin. wide or less, ovate, ovate-oblong, or linear-lanceolate, acute, base rounded, margin revolute and ciliate with long glandular hairs, otherwise glabrous. *Flowers* densely racemose at the ends of the branches, bracts like reduced leaves. *Sepals* 1½–1¾ lin. long, resembling the leaves. *Corolla* nodding, 5 lin. long, obliquely ovate-urceolate, glabrous, rich purple. *Stamens* included; anthers oblong, muticous. *Ovary* glabrous.

Fig. 1, leaves; 2, flower; 3, calyx and androecium; 4 and 5, anthers; 6, ovary; 7, cross-section of ovary:—*all enlarged.*

8444.

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TAB. 8444.

STYRAX WILSONII.

China.

STYRACEAE.

STYRAX, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 669.

Styrax Wilsonii, *Rolfe*; affinis *S. japonici*, Sieb. et Zucc., foliis duplo minoribus et irregulariter dentatis floribusque duplo minoribus differt.

Fruticulus compactus, ramosissimus; rami novelli subteretes, pubescentes. *Folia* alterna, petiolata, elliptico-ovata, irregulariter et pauce dentata, parce pubescentia pilis saepe stellatis, 1–1·5 cm. longa, venis lateralibus paucis subtus prominentibus; petiolus 2 mm. longus. *Flores* in racemos axillares terminalesque breves laxos simplices paucifloros dispositi. *Pedunculi* circiter 3 mm. longi. *Calyx* campanulatus, stellato-pubescens, 2·5–3 mm. longus; lobi triangulari-rhomboidei, subacuti, 0·5–1 mm. longi. *Corolla* alba, 8–10 mm. longa, 5-partita; tubus 2–3 mm. longus; lobi subpatentes, elliptico-oblongi, pilis minutissimis stellatis dense obsitis, aestivatione imbricati. *Stamina* 10, subaequalia; filamenta 5 mm. longa; antherae lineares, flavae, 2·5 mm. longae. *Ovarium* ovoideum, pubescens; stylus 1 cm. longus. *Fructus* globoso-ovoideus, 7–8 mm. longus, minutissime cinereo-velutinus; semen globoso-ovoideum, 6–7 mm. longum, brunneum.—R. A. ROLFE.

The genus *Styrax* is represented in gardens by some half-dozen species of great beauty and distinction. Of these the best and hardiest is *S. japonicum*, Sieb. and Zucc., figured at t. 5950 of this work as *S. serrulatum*, from which, however, it is quite distinct. The others include *S. Obassia*, Sieb. and Zucc., which is given at t. 7039, and *S. Hemsleyanum*, Diels, which occupies t. 8339. Neither *S. americanum*, Lam., nor *S. officinale*, Linn., which may be grown successfully in somewhat warmer localities, are very hardy at Kew. The species which forms the subject of our illustration is quite distinct from any of the foregoing; it comes nearest to *S. japonicum*, but is about half the size of that plant in all its parts. It is a compact shrub of shapely form, and flowers at a remarkably early age; the plant which yielded the material for our plate in June, 1911, is one which was raised from seed in 1909, but it had actually flowered, though less freely, in 1910, when only seventeen months old. The seed from which the plant was raised was presented to Kew by the Arnold Arboretum and had been

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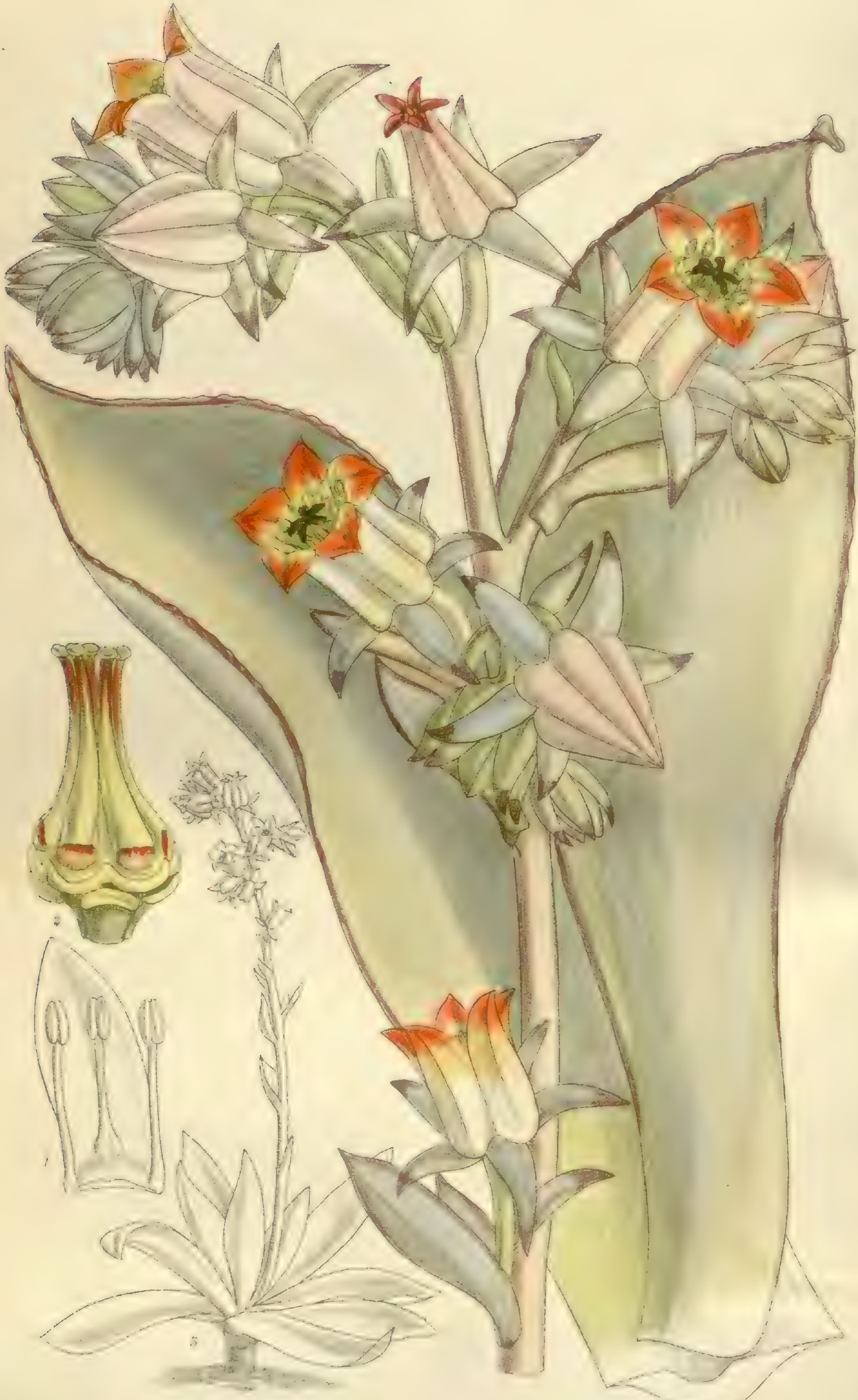
collected by Mr. E. H. Wilson in China in 1908. As regards the hardiness of *S. Wilsonii* we are not yet in a position to pronounce definitely; Mr. Wilson thinks it may be tender while young but hardy after a firm woody stem has been established. In any case, for the present, it will be desirable to afford protection for young plants during severe frost, though it may be remarked that when, during the winter of 1911–12, on one occasion 18°–20° of frost were registered, only the tips of the twigs were injured in the nursery at Kew. Propagation can be secured by layers, but it will probably be preferable to rely on seeds, more especially since the plants flower when so young.

Description.—*Shrub*, small and compact; young twigs subterete, pubescent. *Leaves* alternate, petioled, elliptic-ovate, irregularly and sparingly toothed, sparingly pubescent with usually stellate hairs, $\frac{1}{2}$–$\frac{2}{3}$ in. long, $\frac{1}{4}$–$\frac{1}{3}$ in. wide, secondary nerves 2–3 on each side somewhat raised beneath; petiole about $\frac{1}{12}$ in. long. *Flowers* in axillary and terminal short, open, few-flowered racemes, their stalks about $\frac{1}{8}$ in. long. *Calyx* campanulate, stellate-hairy, $1\frac{1}{4}$–$1\frac{1}{2}$ lin. long, lobes triangular-rhomboid, subacute, very short. *Corolla* white, $\frac{1}{3}$ in. long or rather longer, 5-partite; tube $\frac{1}{12}$–$\frac{1}{8}$ in. long; lobes imbricate, somewhat spreading, elliptic-oblong, finely closely stellate-puberulous. *Stamens* 10, subequal; filaments $\frac{1}{5}$ in. long; anthers linear, yellow, $\frac{1}{5}$ in. long. *Ovary* ovoid, pubescent; style $\frac{2}{5}$ in. long. *Fruit* globose-ovoid, about $\frac{1}{3}$ in. long, finely grey-velvety; seed globose-ovoid, about $\frac{1}{4}$ in. long, brown.

Fig. 1, calyx and pistil; 2, pistil, calyx partly removed; 3, corolla and androecium, in vertical section; 4 and 5, anthers; 6, fruits; 7, a solitary fruit; 8, seed:—*all enlarged except 6, which is of natural size.*

8445



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TAB. 8445.

COTYLEDON SUBRIGIDA.

Mexico.

CRASSULACEAE.

COTYLEDON, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 659.

Cotyledon subrigida, *Robins. and Seaton in Proc. Amer. Acad.* vol. xxviii. p. 105; affinis *C. gibbiflorae*, Moç. and Sessé, sed foliis oblanceolatis acutis, ramis paniculae brevioribus et magis erectis floribusque aurantiacis perglaucis differt.

Herba succulenta, breviter caulescens, omnino glabra. *Caulis* 2 cm. crassus. *Folia* circiter 18, rosulata, adscendentia vel patula, sessilia, crasso-carnosa, 10–15 cm. longa, 5–6·5 cm. lata, oblanceolata vel sublanceolata, acuta, viridia, glauca, marginibus rubris leviter crispatis. *Pedunculi* axillares, circiter 50 cm. alti, superne in racemis 3–5 secundis adscendentibus ramosi, pallide virides vel rubescentes, glauci. *Bracteae* inferiores 2–3·5 cm. longae, 9–17 mm. latae, superiores gradatim minores, sessiles, ovato-lanceolatae, acutae, basi breviter calcaratae, glauco-virides, rubro-marginatae. *Pedicelli* 4–18 mm. longi, glauco-virides. *Sepala* valde patula, 1·3–1·7 cm. longa, basi 5–6 mm. lata, superne attenuata, acuta, glauca, rubro-marginata. *Corolla* 2 cm. longa, 1·5 cm. diametro, 5-angularis, urceolata, fere ad basin 5-loba, pulchre aurantiaca, inferne lutescens, perglauca; lobi arcte imbricati, apice patuli, oblongi, acuti. *Stamina* 10, inclusa; antherae atrorubrae; pollen luteum. *Glandulae hypogynae* 1 mm. longae, 3 mm. latae, transversim oblongae, integrae, rubrae. *Carpella* 1·6 cm. longa, in stylum gradatim attenuata, inferne pallide viridia, superne fusco-purpurea.—*Echeveria subrigida*, Rose in Bull. New York Bot. Gard. vol. iii. p. 10.—N. E. BROWN.

The handsome *Cotyledon* which forms the subject of our illustration is very distinct from any of the other species of this genus now in cultivation, though among these it is, perhaps, more nearly allied to the familiar *C. gibbiflora*, Moç. and Sessé, than to any other. But from *C. gibbiflora* it differs widely in the form and colour of its leaves, and in the rich orange tint of its corolla, which is very glaucous on the outside. The branches of the inflorescence are shorter, more erect and stiffer. *C. subrigida* was first discovered in Mexico, in October, 1892, by Mr. C. G. Pringle, growing on ledges of cliffs in the Tultenango Cañon. The plant from which the material for our figure has been obtained was presented to Kew in 1905 by the authorities of the Natural History Museum, Washington, U.S.A., under the

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name proposed by Dr. Rose. It has grown vigorously in the cooler end of the Succulent House at Kew and flowered profusely in October, 1911. Like the other species of the genus in cultivation it is easily grown if placed in a sunny position out of doors during the summer and protected from frost in winter by being transferred to a greenhouse or a heated frame.

DESCRIPTION.—*Herb*, succulent and shortly stemmed, everywhere glabrous. *Leaves* about 18, rosulate, ascending or the lower spreading, sessile, thickly fleshy, 4–6 in. long, 2–2½ in. wide, oblanceolate or almost lanceolate, acute, green and glaucous, with red somewhat crispate margin. *Peduncles* axillary, about 1½ ft. high, branching upwards into 3–5 ascending, secund racemes, pale green or tinged with red, and glaucous. *Bracts* sessile, ovate-lanceolate, acute, shortly spurred at the base, glaucous-green with red margin, gradually diminishing upwards, the lowest ¾–1¼ in. long, ⅓–⅔ in. across. *Pedicels* ⅙–⅔ in. long, glaucous-green. *Sepals* markedly spreading, ½–⅔ in. long, about ¼ in. wide at the base, narrowed upwards, acute, glaucous with red margin. *Corolla* ⅘ in. long, ⅗ in. wide, urceolate, 5-angled, 5-lobed almost to the base, brilliant orange above, yellowish lower down, very glaucous; lobes closely imbricate, spreading at the tip, oblong, acute. *Stamens* 10, included; anthers dark-red; pollen yellow. *Hypogynous glands* transversely oblong, entire, red, ⅛ in. wide, very short. *Carpels* over ½ in. long, gradually narrowed into the style, pale green below, dull purple upwards.

Fig. 1, petal with three stamens; 2, carpels and hypogynous scales; 3, sketch of an entire plant:—1 *and* 2 *enlarged*, 3 *much reduced*.

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TAB. 8446.

PSEUDERANTHEMUM LILACINUM.

Malay Peninsula.

ACANTHACEAE. Tribe JUSTICIEAE.

PSEUDERANTHEMUM, *Radlk.*; *Lindau in Engl. & Prantl, Nat. Pflanzenfam.*, vol. iv. pars iii. B, p. 330.

Pseuderanthemum lilacinum, Stapf; species nova *P. Teijsmannii,* Stapf (Eranthemo Teijsmannii, *King*), proxima, sed foliis angustis repando-undulatis magis pubescentibus, panicula latiore, corolla lilacina, staminodiis distincte evolutis, stylo pilosulo distincta.

Suffrutex cultus erectus, ad 1·2 m. altus, ramis teretibus adpresse tenuiter pubescentibus demum subglabratis. *Folia* lanceolata, longe acuminata, late repando-undulata, basi acuta vel rotundata, 12–25 cm. longa, 3·5–5·5 cm. lata, viridia, tactu mollia, in nervis minute pubescentia, praeterea parce pilis rigidulis minutis aspersa, nervis lateralibus utrinsecus 8–9 obliquis intra margines saltem superne eximie arcuatim connexis; petiolus 1–4 cm. longus, tenuiter pubescens. *Inflorescentia* paniculata, ramis inferioribus ad 1·5 cm. longis obliquis intermediis multo brevioribus summis brevissimis omnibus apice cymas congestas 5–3-floras gerentibus adpresse tenuiter pubescentibus; pedicelli demum 2–3 mm. longi; bracteae lanceolatae vel e basi latiuscula subulatae, ad 3 mm. longae, tenuiter pubescentes; bracteolae bracteis simillimae nisi minores. *Calyx* 4–5 mm. longus, laxe tenuiter pubescens, profunde 5-fidus, segmentis lineari- vel subulato-linearibus. *Corollae* tubus angustus, rectus, albidus, circiter 4 cm. longus, extra parce minutissime glandulosus intra inter filamenta decurrentia albo-pilosus; limbus coeruleo-lilacinus, in labii inferioris segmento intermedio maculo albo vel lutescente et punctis rubris minutis notatus, 3 cm. latus, extra glaber, intus in maculo pilosulus, segmentis subaequalibus, 13–15 mm. longis, 6–8 mm. latis, labii superioris approximatis oblongis labii inferioris divergentibus ovato-oblongis omnibus obtusis. *Antherae* exsertae, nigro-coeruleae, 1 mm. longae; filamenta 1·5 mm. longa, filiformia. *Staminodia* filiformia, apice capitatim incrassata, brevissima vel ad 0·8 mm. longa. *Ovarium* glabrum. *Capsula* ignota.—O. STAPF.

The *Pseuderanthemum* of which a figure is here given is a native of Selangor, and perhaps also of other parts of the Malay Peninsula. The plant which has provided the material for our illustration was presented to Kew in 1909 by Mr. H. N. Ridley, then Director of the Singapore Botanic Garden; it was sent under the name *Eranthemum Teijsmannii,* and it is certainly very nearly allied to the species described as *E. Teijsmannii* by the late Mr. C. B.

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Clarke in the materials for a Flora of the Malayan Peninsula edited by the late Sir G. King and Mr. J. S. Gamble, which is, in turn, no doubt also the species referred to as *E. Teijsmannii* by Mr. Ridley in his account of an expedition to Temengoh in the Journal of the Straits Branch of the Royal Asiatic Society in 1909. But while the two are so closely related, they differ very materially in the points to which Dr. Stapf directs attention, and more particularly in respect of their habit, for *E. Teijsmannii*, as limited by Mr. Clarke, is a "shrubby creeper," and is spoken of by Mr. Ridley as "easily recognised by its climbing habit, scrambling to some height up bushes and often forming a bulky mass." Whether Mr. Clarke's species be identical with the original *E. Teijsmannii*, T. And., a plant cultivated in the Royal Botanic Garden, Calcutta, originally sent there from Java, is not clear. All that is definitely known of that plant is that it too is one "with a straggling habit," and therefore unlike the subject of our plate, which forms an erect shrub some 3 feet in height. Grown in a Tropical House under the conditions suitable for Begonias it thrives well and flowers in April. As a garden plant it is comparable in value with the other species of the genus *Pseuderanthemum* already in cultivation, an African member of which, *P. seticalyx*, Stapf, has already been figured at t. 8244 of this work.

Description.—*Shrub*, about 3 ft. high; branches terete, at first thinly adpressed pubescent, ultimately glabrous. *Leaves* lanceolate, long-acuminate, widely repandly undulate, base cuneate or rounded, 4½–10 in. long, 1½–2¼ in. wide, green, soft, minutely pubescent on the nerves and elsewhere sparingly minutely rigidly hairy, lateral nerves 8–9 on each side, oblique, looping within the margin especially towards the apex; petiole ⅕–1¾ in. long, thinly pubescent. *Inflorescence* paniculate, its lower branches up to ½ in. long, oblique, those higher up much shorter, the uppermost very short, all with terminal congested 3–5-flowered cymes; pedicels ultimately 1–1½ lin. long, thinly adpressed pubescent; bracts lanceolate or subulate from a rather wide base, 1½ lin. long, thinly pubescent; bracteoles like the bracts but smaller. *Calyx* 2–2½ lin. long, thinly loosely pubescent, deeply 5-fid; lobes linear- or subulate-lanceolate. *Corolla-tube* narrow, straight, about 1½ in. long, almost white, finely sparsely glandular outside, within white-pilose between the decurrent filaments; limb lilac-blue, with a white or yellowish blotch and a number of minute red specks on the mid-lobe of the lower lip, 1¼ in. across, glabrous outside, pilose within on the blotch, lobes subequal, ½–⅗ in. long, ¼–⅓ in. wide, those of the upper lip close together, those of the lower lip divergent, all ovate-oblong, obtuse. *Anthers* exserted, very dark blue; filaments very short, filiform. *Staminodes* filiform, with swollen tips, short or very short. *Ovary* glabrous. *Fruit* not seen.

Fig. 1, calyx and pistil; 2, corolla-throat, laid open, showing stamens and staminodes; 3 and 4, anthers:—*all enlarged.*

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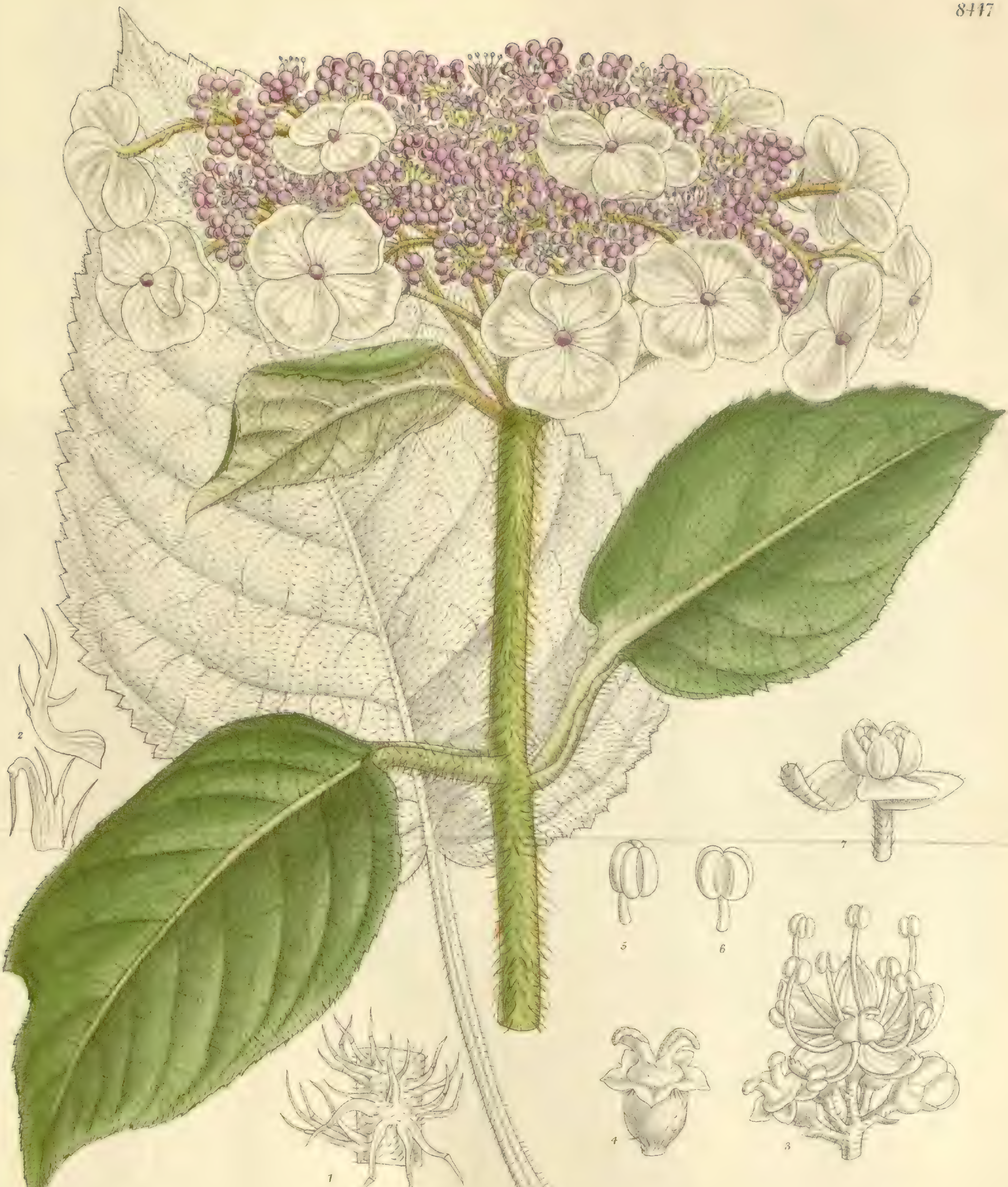

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TAB. 8447.

HYDRANGEA SARGENTIANA.

China.

SAXIFRAGACEAE. Tribe HYDRANGEAE.

HYDRANGEA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 640.

Hydrangea Sargentiana, *Rehder in Sargent, Pl. Wilson.* pars i. p. 29; species *H. Rosthornii*, Diels, proxima, sed caulis indumento rudi, floribus paullo minoribus, sepalis florum sterilium integris distinguendum.

Frutex ad 2 m. altus, ramis superne villis rudibus et setulis intermixtis obtectis. *Folia* ovata, breviter acuminata, basi cordata vel rotundata, inaequaliter crenata crenis latiusculis apiculatis, 15–30 cm. longa, 6·5–16 cm. lata, supra obscure viridia, adpresse strigosa, subtus laxe strigoso-tomentosa; petioli pubescentes villis rudibus hinc inde admixtis. *Corymbus* densus, 12–16 cm. diametro, axibus omnibus pubescenti-tomentosis primariis praeterea pilis longioribus et hinc inde villis rudibus obsitis; radii primarii suboppositi ad 12 vel 13, ad 7 cm. longi; bracteae mox deciduae, lanceolatae, acuminatae, dense strigillosae; pedicelli florum fertilium ad 2 mm. longi, graciles, sterilium ad 15 mm. longi. *Flores fertiles* ante ipsa anthesi 2·5–3 mm. diametro, violascentes, depresso-globosi. *Receptaculum* turbinatum, 1 mm. longum, subglabrum. *Sepala* late triangularia, 0·5 mm. longa. *Petala* mox decidua, oblongo-ovata, vix 2 mm. longa. *Staminum* filamenta breviora petala aequantia, majora ea subduplo superantia. *Ovarium* subinferum; styli 2 vel 3. *Capsula* (ex autore) hemisphaerica, leviter 10-12-costata, 3 mm. diametro. *Semina* elliptica, utrinque in alam brevem contracta, striata, circa 0·7 mm. longa. *Flores steriles* radiantes, 2·5–3·5 cm. diametro, albi, sepalis late obovato-orbicularibus integris in dorso laxe strigilloso-pilosis.—O. STAPF.

The *Hydrangea* which forms the subject of our plate was discovered in China by Mr. E. H. Wilson, at Hsing-Shan-Hsien, Western Hupeh, at about 5000 to 6000 feet above sea-level, in 1907. A share of Wilson's seeds was presented to Kew by Professor Sargent, Arnold Arboretum, early in 1908; from these seeds was raised the plant which has supplied the material for our figure. *H. Sargentiana* is readily recognisable, and from a cultural standpoint is very distinct owing to the conspicuously bristly covering of its stems and petioles, though apart from this rather striking feature there does not appear to be much to distinguish it from its nearest ally, *H. Rosthornii*, Diels, another Chinese form, which appears to serve as a connecting link between our plant and the Himalayan *H. robusta*, Hook. f. & Thoms. *H. Sargentiana* does not give promise of being one of the hardiest of its genus; several young plants succumbed at Kew to the winter conditions of 1909–10, and since then the remaining plants have been afforded protection in severe weather. It is to be hoped that as its age increases, and it becomes more woody, this striking and beautiful shrub may prove more robust, especially as it flowers in late July, when flowering shrubs are particularly in request. A strong grower, it needs good loamy soil, and it is probable that, as in the case of the other Hydrangeas, the most satisfactory method of propagation will be by cuttings.

DESCRIPTION.—*Shrub*, 6–7 ft. high; branches clothed upwards with harsh hairs and stiff bristles. *Leaves* ovate, shortly acuminate, base cordate or rounded, margin crenate, the teeth unequal, rather broad, apiculate, 6–12 in. long, 2¾–6½ in. wide, dull green above, with adpressed hairs, beneath paler and loosely strigosely hairy; petiole pubescent, with an admixture of harsher hairs. *Corymb* dense-flowered, 5–6½ in. across, the axes and especially the main ones tomentose with a mixture of longer hairs, some of them harsh, the main rays up to 12 or 13, almost opposite, 2¾ in. long; bracts soon deciduous, lanceolate, acuminate, densely strigose; pedicels of the fertile flowers 1 lin. long, slender, of the sterile flowers ½–⅔ in. long. *Fertile flowers* before opening 1½ lin. long, pale violet, depressed-globose. *Sepals* wide-triangular, very short. *Petals* soon deciduous, oblong-ovate, under 1 lin. long. *Stamens* 2-seriate, filaments of the shorter series as long as the petals, those of the longer series nearly twice as long as petals. *Ovary* almost inferior; styles 2–3. *Capsule* hemispherical, slightly 10–12-ribbed. 1½ lin. wide. *Seeds* elliptic, narrowed at both ends into a short wing, striate, very small. *Sterile flowers* ray-like, 1–1½ in. across, white; sepals broadly obovate-orbicular, entire, loosely strigosely hairy on the back.

Fig. 1, portion of a flowering-axis; 2, hairs from the axis; 3, fertile flowers; 4, calyx and pistil; 5 and 6, anthers; 7, a young outer flower:—*all enlarged.*

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Tab. 8448.

ALOE Steudneri.

Eritrea and Abyssinia.

Liliaceae. Tribe Aloineae.

Aloe, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 476.

Aloe Steudneri, *Schweinf. in Bull. Herb. Boiss.* vol. ii. App. ii. p. 73; *Baker in Dyer Fl. Trop. Afr.* vol. vii. p. 458; *Berger in Engler, Pflanzenr. Liliaceae-Aloineae,* p. 287; affinis *A. Schölleri*, Schweinf., sed foliis magis attenuatis marginibus cartilagineis angustioribus pedicellis multo longioribus et perianthii segmentis basi tantum connatis differt.

Herba succulenta, acaulis vel subcaulescens, dichotome divisa. *Folia* circiter 25, dense rosulata, erecto-patentia vel subincurva, carnosa, 5·5–6 dm. longa, basi 12–15 cm. lata, gradatim attenuata, apice acuta, margine anguste cartilaginea, dentata, pallidissime roseo-tincta dentibus parvis, deltoideis, 1–2 mm. longis, 1–4 cm. inter se sejunctis, supra plana vel leviter convexa sed prope apicem concavo-canaliculata, subtus versus marginem singulum crassiora ideoque oblique convexa, vix carinata. *Inflorescentiae* saepe 2 ex eadem rosula, pedunculis simplicibus vel superne ramosis erectis glaucis sursum purpureo-tinctis 8–9 dm. altis, ramis racemosis 15–25 cm. longis; bracteae erectae, imae pedunculo ramove adpressae, eae flores subtendentes convolutae, pedicellos amplectentes, 1·5–2 cm. longae, ovato-lanceolatae, acuminatae, carinatae, nervis striatae, rubrae; pedicelli 1·8–2 cm. longi, rubri, apice recurvi. *Perianthum* 4·7–5·3 cm. longum, 1·4 cm. latum, trigono-cylindricum, deflexum et prope apicem minopere recurvum, ad basin fere 6-partitum; segmenta lineari-oblonga, obtusa, exteriora 3 recta, intense rubra, interiora 3 apice recurva, inferne rosea, apice fusco-lutea, rubro-costata. *Stamina* inclusa vel subinclusa, filamentis pallide luteis, antheris brunneis, polline salmoneo-carneo. *Stylus* demum exsertus, pallide luteus.

The handsome Aloe here figured, which was first described by Dr. Schweinfurth in 1894, is a species for whose introduction European horticulture is indebted to Professor Penzig of Genoa. Schweinfurth's account of the plant was based on Abyssinian specimens gathered by Dr. Steudner in the Ghaba Valley at about 11500 feet above sea-level in 1862, and on some inflorescences collected by Penzig on Mt. Sabr in Eritrea at an altitude of 8500 feet in 1891, along with the living plants whereof that whence our material has been obtained forms one. That *A. Steudneri* is a species as distinct as it is striking has never been in doubt; its precise position and its exact relationship to other species have, however, been somewhat obscure. This

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obscurity has had its origin in the somewhat fragmentary character of the original material, and has been increased by the capricious disposition of the species in the matter of flowering. There is a healthy plant in the succulent collection at Kew, kindly presented by Professor Penzig in 1896. But this plant, though it thrives well under the conditions suitable for other Aloes, has not so far flowered. On the other hand a plant sent by Professor Penzig to the Cambridge Botanic Garden flowered there as early as March 1901. The material for our figure has, however, been derived from yet another plant which flowered for the first time in the garden of Lady Hanbury at La Mortola in April 1911. During the journey in the course of which Penzig rediscovered Steudner's Aloe, he collected young plants of an Aloe which he believed might be *A. Schimperi*, Schweinf.; one of these plants was given by him to the late Sir Thomas Hanbury in 1901. When this plant did at length flower it proved to be in reality *A. Steudneri*; the figure here given has been prepared from its flowers and from a photograph communicated, along with a full description, by Mr. A. Berger. In the account here given full use has been made of that description, and of one by Mr. Brown, who, ten years earlier, had occasion to deal with the Cambridge plant. It may be noted, however, that while these two very competent authorities are satisfied that the plant is *A. Steudneri* there is still some obscurity as to its position in the genus. Dealing with this point in the 'Pflanzenreich,' Mr. Berger places the species provisionally at the end of the section *Purpurascentes* with *A. purpurascens*, Haw., and *A. succotrina*, Lamk. The study of the living plant has led Mr. Berger to suggest that its affinities are rather with *A. percrassa*, Tod., and *A. rubro-lutea*, Schinz, and has induced Mr. Brown to suggest a close relationship with *A. Schölleri*, Schweinf. However this may be, the plant, in spite of the shyness with which it flowers, is a striking one and well worthy of a place in succulent collections.

DESCRIPTION.—*Herb*; succulent, nearly stemless, branching at the base. *Leaves* about 25, in a dense rosette a yard across, erect and somewhat spreading or incurved near the point, about 2 ft. long, 5–6 in. wide at the base, gradually narrowed to the acute point, with a narrow hyaline somewhat rose-coloured toothed margin, the teeth 1 lin. long or less and separated by intervals of from $\frac{1}{4}$–$1\frac{1}{2}$ in., upper surface flat or slightly convex, but towards the point concave and channelled, under surface obliquely convex owing to one side of the leaf being rather thicker than the other, hardly keeled. *Inflorescences* usually 2 from the same crown; peduncles erect, simple or sparingly branched, nearly 3 ft. high, glaucous with a purple tinge upwards; the branches racemose, 6–10 in. long; bracts erect, those below empty, adpressed to their stem or branch, the flowering ones convolute, embracing the pedicels, $\frac{1}{2}$–$\frac{3}{4}$ in. long, ovate-lanceolate, acuminate, keeled, striate, red; pedicels $\frac{2}{3}$–$\frac{3}{4}$ in. long, red, recurved at the tip. *Perianth* about 2 in. long, over $\frac{1}{2}$ in. wide, slightly trigonous, deflexed and then slightly upturned near the top, 6-partite nearly to the base; segments linear-oblong, obtuse, the 3 outer straight, deep red, the 3 inner recurved at the tip, rose-pink below, dark yellow at the tip, with red veins. *Stamens* included or nearly so; filaments pale yellow; anthers brown; pollen salmon-coloured. *Style* at length exserted, pale yellow.

Figs. 1 and 2, anthers; 3, ovary and style; 4, an entire plant, from a photograph:—*all enlarged except 4, which is much reduced.*

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Tab. 8449.

MUEHLENBECKIA COMPLEXA.

New Zealand.

Polygonaceae. Tribe **Coccolobeae.**

Muehlenbeckia, *Meisn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 101.

Muehlenbeckia complexa, *Meisn. Pl. Vasc. Gen.* pars alt. p. 227, and in *DC. Prodr.* vol. xiv. p. 147; *Hook. f. Handb. Fl. N. Zeal.* p. 236; *Dammer in Engl. & Prantl, Naturl. Pflanzenfam.* vol. iii. p. 32; *Cheeseman, Manual N. Zeal. Flora*, p. 592; species a *M. adpressa*, Labill., stigmate papilloso nec fimbriato recedit, facie *M. axillaris*, Hook. f., quae floribus subsolitariis differt.

Herbae gregariae aut moles magnas formantes aut super frutices vel rupes repentes. *Caulis* lignosus, tenuis, rubro-brunneus, scaber vel verrucosus. *Folia* orbicularia vel breviter oblonga, integra vel ad medium panduriformiter contracta, obtusa vel emarginata, rarius subacuta, basi cordata vel rotundata, 5–25 mm. longa, 4–20 mm. lata, utrinque glabra, marginibus leviter incrassatis; petiolus tenuis, quam lamina paullo brevior, pubescens; stipulae deciduae. *Flores* dioici vel polygamo-dioici. *Spicae* axillares, circiter 15 mm. longae, sessiles vel breviter pedunculatae; bracteolae late ovatae, 2 mm. longae, brunneae, scariosae, dorso infra apicem mucronatae, ciliatae. *Perianthium* album vel virescens, profunde 5-partitum, 4 mm. longum; segmenta oblonga, obtusa. *Stamina* 8. *Flores feminei*: *Perianthium* ei florum masculorum similis. *Discus* brevis, irregulariter lobatus. *Ovarium* trilobum; stigma trilobatum, magnum, papillosum. *Achenium* nigrum, nitens, in perianthio accrescente carnoso nitido albo inclusum.—*Polygonum complexum*, A. Cunn. in Ann. Nat. Hist. ser. 1, vol. i. p. 455 (1838); Hook. in Bot. Mag. vol. lxxii. App. p. 5 (1846); Hook. f. Fl. N. Zeal. vol. i. p. 210. *Muehlenbeckia microphylla*, Colenso in Trans. N. Zeal. Inst. vol. xx. p. 204. *M. paucifolia*, *M. trilobata* et ***M. truncata***, **Colenso, l.c., vol. xxi. pp. 99–101.—C. H. Wright.**

The Polygonaceous genus *Muehlenbeckia* includes some fifteen species, widely spread in the Southern Hemisphere from Australia and New Zealand through Polynesia to extra-tropical and Andine South America. They vary much in habit, some of them being climbers which much resemble species of *Convolvulus,* while one has flattened branches and has much the appearance of certain species of *Acacia*. Four of these Muehlenbeckias have been introduced to gardens in this country and two of them have already been figured in this work; *M. adpressa*, Meisn., as *Polygonum adpressum,* Labill., at t. 3145, and *M. platyclados*, Meisn., as *Coccoloba platyclada*, F. Muell., at t. 5832. The species now figured, which is a well-known plant in gardens in the

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warmer parts of the United Kingdom, was introduced into the Royal Botanic Gardens, Kew, in 1842 by the Rev. W. Colenso. Somewhat variable in the character of its foliage, Mr. Colenso has recognised as distinct four different and fairly recognisable forms naturally encountered. Mr. Cheeseman has described it as forming dense thick elastic masses many feet in diameter or climbing over bushes or rocks. At Kew it exhibits the same features, but it is here unfortunately liable to partial injury from frost, so that large masses are apt to become disfigured. The material for our illustration was obtained from a specimen sent from Herm Island, Guernsey, by Mr. D. Hill, Herga, Watford. The perianth in fruit is accrescent, and becomes glistening white.

Description.—*Herbs* with thin, woody, reddish-brown, scabrid or finely warted stems, growing gregariously and forming dense tufted masses or climbing over shrubs or rocks. *Leaves* orbicular or shortly oblong, entire or pandurately contracted about the middle, obtuse or emarginate at the apex, cordate or rounded at the base, $\frac{1}{5}$–1 in. long, $\frac{1}{6}$–$\frac{3}{4}$ in. wide, glabrous on both sides, with slightly thickened edge; petiole slender, rather shorter than the leaf-blade; stipules deciduous. *Flowers* dioecious or polygamo-dioecious. *Spikes* axillary, about $\frac{2}{3}$ in. long, sessile or shortly peduncled; bracteoles wide-ovate, 1 lin. long, brown, scarious, mucronate on the back a little below the tip, ciliate. *Perianth* white or greenish, deeply 5-lobed, 2 lin. long; the lobes oblong, blunt. *Stamens* 8. *Female perianth* as in the male flower. *Disk* short, irregularly lobed. *Ovary* 3-lobed; stigma 3-lobed, large, papillose. *Nutlets* black, shining, enclosed in the fleshy glistening enlarged perianth, which becomes white as the fruit ripens.

Fig. 1, section of a female flower, showing the pistil; 2, the same, pistil removed, showing the disk; 3, a pistil; 4, ripe fruit, enclosed in the accrescent perianth; 5, the same in section, showing the nutlet:—*all enlarged.*

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TAB. 8450.

PYCNOSTACHYS DAWEI.

Uganda.

LABIATAE. Tribe OCIMOIDEAE.

PYCNOSTACHYS, *Hook.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1177.

Pycnostachys Dawei, *N. E. Br. in Gard. Chron.* 1907, vol. xli. p. 18; species *P. affini*, Gürke, verisimiliter proxima, sed foliis distincte petiolatis, calycis tubo glandulis sessilibus instructo haud villoso dentibus basi ciliatis differt.

Herba robusta, 1·2–1·8 m. alta, laxe ramosa, ramis tetragonis puberulis. *Folia* anguste lanceolata vel lineari-lanceolata, 1·2–3 dm. longa, 1·2–4 cm. lata, apice longe attenuata vel fere caudata, basi in petiolum gradatim angustata, regulariter serrata, utrinque breviter pubescentia, infra glandulis ferrugineis sessilibus praedita. *Spicae* terminales, ellipsoideo-ovoideae, 3–13 cm. longae, 3–4 cm. latae, densissime multiflorae. *Bracteae* spathulato-lanceolatae, 9–12 mm. longae, incurvae, longe albo-ciliatae. *Calycis* paulum accrescentis tubus brevis, glandulis sessilibus dense vestitus, inter dentes in lobulos submembranaceos ciliatos productus; dentes aciculares, 6 (post anthesin usque ad 15) mm. longi, basi longe albo-ciliati. *Corolla* vivide caerulea, 1·8–2·2 cm. longa, extra sparse breviter pubescens; tubus dimidio inferiore gracilis, circa medium subito deflexus et compresso ventricosus; labium superum planum, subcuneatum, 5 mm. longum et latum, breviter aequaliter 4-lobum; labium inferum compresso-naviculare, circiter 1 cm. longum, apice acuminatum et abrupte inflexum. *Stamina* in labio infero inclusa; filamenta edentata vel 1–3 cum dente plus minusve prominente instructa. *Nuculae* globoso-lenticulares, disco antice valde producto circumdatae.—S. A. SKAN.

The handsome winter-flowering Labiate here figured was first discovered in Uganda in 1898 by the late Mr. A. Whyte, but for its first appearance in cultivation horticulture is indebted to Mr. M. T. Dawe, formerly Director of the Scientific and Forestry Department, Uganda, who sent seeds to Kew in 1905, as well as herbarium specimens collected at an elevation of 4000 feet in the districts of Mabira and South Buddu. Plants raised from these seeds flowered in January 1906. The specimen now figured was sent to Kew for identification by Dr. A. R. Wallace, in December 1911, and originated from seeds received by him from Uganda.

The genus *Pycnostachys* comprises about thirty-six Tropical African species, two of which are also met with in South Africa, with one, *P. coerulea*, Hook., which is confined to Madagascar, and one, *P. purpurascens*, Briq., known only

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from South Africa. Two besides *P. Dawei* have appeared in cultivation, namely *P. coerulea* and *P. urticifolia*, Hook., the latter of which is figured at t. 5365 of this work. The genus is distinguished from *Plectranthus* and *Coleus* by the much denser inflorescences and the spinescent calyx-teeth. *P. Dawei* is probably most nearly allied to *P. affinis*, Gürke, but that species is known at Kew from description alone; Dr. Gürke's species is understood to have sessile leaves—in *P. Dawei* they are usually distinctly petiolate.

In cultivation *P. Dawei* forms a somewhat straggling shrub and calls for the same treatment as *Coleus thyrsoideus*, Baker, another Labiate from Uganda, which is more familiar in greenhouses than the subject of our plate. But, while not difficult to grow, its flowers are apt to be injured at Kew by fogs.

DESCRIPTION.—*Herb*; stems stout, 4–6 ft. high, laxly branched; branches 4-angled, puberulous. *Leaves* narrow-lanceolate or linear-lanceolate, 5–12 in. long, ½–1¾ in. wide, considerably narrowed to the tip, sometimes almost caudate, gradually narrowed to the base, margin uniformly serrate, shortly pubescent on both surfaces, beset with rusty sessile glands beneath. *Spikes* terminal, elliptic-ovoid, 1¼–5 in. long, 1¼–1¾ in. across, dense, many-flowered. *Bracts* spathulate-lanceolate, ⅓–½ in. long, incurved, ciliate with long white hairs. *Calyx* slightly accrescent; tube short, densely beset with sessile glands, its limb produced between the teeth into ciliate almost membranous lobules; teeth acicular, in flower ¼ in., in fruit over ½ in. long, sparingly shortly pubescent outside, ciliate at the base with long white hairs. *Corolla* deep blue, ¾–⅘ in. long, sparingly shortly pubescent outside; lower half of the tube slender, near the middle suddenly deflexed and compressed-ventricose; upper lip flat, somewhat cuneate, under ¼ in. long and broad, shortly equally 4-lobed; lower lip compressed-navicular, twice as long as the upper lip, with an acuminate abruptly inflexed tip. *Stamens* nestling within the lower lip; filaments sometimes all toothless or with 1–3 provided with a more or less pronounced tooth. *Nutlets* globose-lenticular; surrounded below by the disk, which is very markedly swollen in front.

Fig. 1, portion of a leaf, showing the under surface; 2, flower; 3, hair; 4, section of calyx, showing nutlets and disk; 5, corolla laid open; 6, a stamen with toothed filament; 7, upper portion of style with stigma:—*all enlarged.*

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TAB. 8451.

AGAVE DISCEPTATA.

Central America?

AMARYLLIDACEAE. Tribe AGAVEAE.

AGAVE, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 738.

Agave (Littaea) **disceptata**, *J. R. Drumm.*; species e grege *A. geminiflorae*, Scannag., et *A. angustissimae*, Engelm., maxime affinis, ab eis autem ob perigonii tubum conspicue breviorem et ob ovarium haud angustatum facile distinguenda.

Suffrutex, trunco perbrevi foliis sat congestis rosulatim dispositis celato. *Folia* fibroso-coriacea, exteriora patentia nec recurva, intermedia recta ascendentia, interiora plus minusve incurva, pedetentim in bracteas abeuntia, lineari-loriformia, parte superiore leniter angustata, basi primum tenui, tunc in pulvinum modicum excrescente, infra quadraeformi, supra ovato-lanceolata, ad 4–5 cm. ultra basin in collum sensim contracta, versus apicem sat obtusum gradatim attenuata ibique spina vix 5 mm. longa armata, pulvino incluso circiter 17 cm. longa, ima basi vix 2·5 cm. lata, apud collum fere 7 mm., ultra collum circiter 10 mm. lata, pulvini medio fere 12 mm. crassa, utraque facie parum convexa, laevigata, laete viridia, in parte superiore praesertim subtus lineis lacteis irregulariter notata, margine subpapyracea, tandem filamentoso-dilacerata. *Scapus* 1·65 m. altus, pedunculo circiter 8 dm. longo bracteis subscariosis elongatis instructo; bracteae basi deltoideae, superne aciculares, subadpressae, ad medium scapum circiter 2·5 cm. longae. *Flores* geminati, in spicam laxiusculam digesti; pedicelli doliiformes brevissimi; bracteolae submembranaceae, obscurae. *Perigonii* lobi margine purpureo-rosei, ceterum viridescentes, ultra 12 mm. longi, fere 5 mm. lati; tubus circiter 12 mm. longus, inferne constrictus ibique circiter 2·5 mm. latus. *Stamina* parum arcuata, circiter 5 cm. longa, filamentis rubescentibus, antheris luteis basi retusis. *Ovarium* circiter 1–2 cm. longum, 5 mm. latum, obscure rubro-notatum; stylus vix 3 cm. longus. *Capsula*, vix matura, 6-loba lobis alternis majusculis minimisque, circiter 1·5 cm. longa, 8 mm. lata. *Semina* circiter 4 mm. longa, atra, polita vix tamen nitentia.—*A. Leopoldi*, Hort. ex Kew Hand-list Tend. Monocot. p. 115.—J. R. DRUMMOND.

The *Agave* which forms the subject of our plate is one which was presented to Kew in 1893 by the late Mr. W. B. Kellock from the valuable collection of succulent plants formed by him in his garden at Stamford Hill. Its history beyond this point is unfortunately obscure in the extreme. It was received at Kew as *A. Leopoldi*, Hort., and at the time of its presentation Mr. Kellock believed it to have originated as the result of crossing *A. filifera*, Salmdyck, with *A. princeps*, Hort.; it has found a place in the Kew Hand-list of Tender Monocots under the name attributed

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to it by Mr. Kellock. It may, however, be pointed out here that this is not the only *Littaea* presented to Kew under the name *A. Leopoldi*; as a matter of fact this plant, the *A. Leopoldi* of the 'Hand-list,' was known in Mr. Kellock's collection as *A. Leopoldi* No. II., and the name has been provisionally restricted to the *Littaea* now figured because *A. Leopoldi* No. I. was found to agree with a plant already under cultivation under an older name. What the identity of '*A. princeps*,' suggested as one of the parents of our plant, may be it has been impossible to ascertain, but the matter is not now of material consequence, since it is found, now that the plant has flowered, that its characters negative the suggestion that it is a hybrid between any two of the *Littaeas* known to have been in cultivation in any part of Europe. On the contrary these characters clearly point to its being a perfectly valid species and, although as to this there is not the same certainty, its characters suggest that it is probably a native of Central America. Like *A. filifera*, *A. disceptata* produces suckers from the base of the stem, and like *A. filifera* has thriven well in the Succulent House at Kew under the conditions suitable for Agaves generally. Here it flowered, eighteen years after its presentation, in October 1911, and provided the material from which our figure has been drawn, and on which it has at last been possible to base a definite description.

Description.—*Succulent undershrub*, stem very short, clothed with a dense rosette of leaves. *Leaves* fibrous-coriaceous, the outermost spreading but not recurved, the central straight ascending, the innermost somewhat incurved, passing gradually into the bracts, linear-loriform, the upper portion very gradually narrowed, the base thin, then suddenly swollen into a pulvinus, which is square below, ovate-lanceolate above, contracted into a neck about 2 in. above the base, at the apex, which is rather blunt, armed with a spine which is under $\frac{1}{4}$ in. long, nearly 1 in. across at the base, about $\frac{1}{3}$ in. wide at the neck and $\frac{2}{5}$ in. wide higher up, the pulvinus about $\frac{1}{2}$ in. thick in the middle, slightly convex, smooth and bright green on both surfaces, but in the upper portion and especially beneath irregularly marked with whitish streaks, the margin almost papery ultimately shredding into thin curled threads. *Scape* about

5½ ft. high, its peduncle about 2½ ft. long, clothed with long subscarious bracts; bracts deltoid at the base, acicular above, somewhat adpressed to the scape, those in the middle about 1 in. long. *Flowers* scattered in a rather loose spike, geminate; pedicels rather thicker in the middle than at either extremity, very short; bracteoles almost membranous, obscure. *Perianth-lobes* greenish with rosy-purple edges, over ½ in. long, about ⅕ in. wide; tube about ½ in. long, narrowed below and there $\frac{1}{10}$ in. wide. *Stamens* slightly curved, about 2 in. long; filaments reddish; anthers yellow, retuse at the base. *Ovary* about ½ in. long, ⅕ in. wide, obscurely streaked with red; style about 1¼ in. long. *Capsule*, barely ripe, 6-lobed, the lobes alternately large and quite small, about ⅔ in. long, ⅓ in. wide. *Seeds* about ⅙ in. long, black and polished but hardly shining.

Fig. 1, section of a leaf; 2 and 3, anthers; 4, stigma; 5, sketch of an entire plant:—*all enlarged except 5, which is much reduced.*

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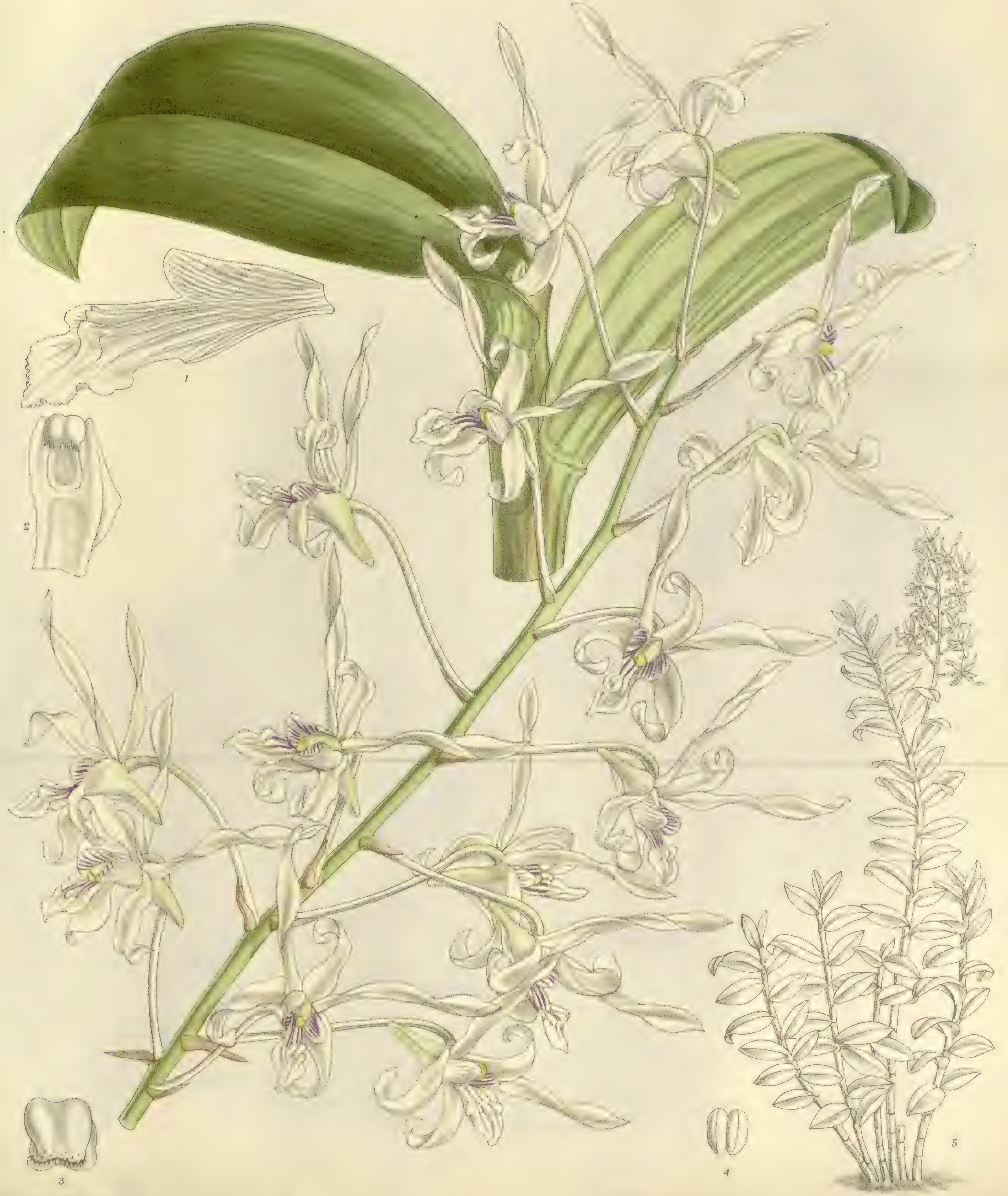

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DENDROBIUM IMTHURNII.

New Hebrides.

DENDROBIUM, *Swartz*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 498.

Dendrobium (Ceratobium) **Imthurnii,** *Rolfe in Kew Bulletin*, 1912, pp. 131, 206; a *D. antennato*, Lindl., caule multo altiore et crassiore, foliis multo latioribus, labello longiore et petalis brevioribus differt.

Herba epiphytica. *Caules* aggregati, 1–1·25 m. alti, basi 2·5–3 cm. lati, supra attenuati, pluriarticulati, foliosi. *Folia* disticha, elliptico-oblonga, obtusa vel apiculata, valde coriacea, 7–10 cm. longa, 3–5·5 cm. lata. *Racemi* axillares, prope apicem ramorum producti, circiter 35 cm. longi, suberecti, multiflori. *Bracteae* late triangulari-ovatae, acutae, 2–4 cm. longae. *Pedicelli* 4–5 cm. longi. *Flores* mediocres, albi, labelli lobis lateralibus lilacino-lineatis. *Sepalum posticum* oblongo-lanceolatum, acutum, spiraliter semitortum, 2 cm. longum; sepala lateralia similia, basi obliqua, et in mentum triangulare acutum 1 cm. longum extensa. *Petala* subpatentia, linearia, acuta, basi attenuata, supra paululo dilatata et torta, 3–3·5 cm. longa. *Labellum* trilobum, 2·5 cm. longum; lobi laterales oblongi, obtusi, minute crenulati; lobus intermedius obovato-lanceolatus, acutus, minute crenulatus, 1·3 cm. longus, circiter 6 mm. latus; lamellae per discum parallelae 3, prope apicem dilatatae, truncatae et minute crenulatae. *Columna* oblonga, 6 mm. longa.—R. A. ROLFE.

The striking *Dendrobium*—perhaps the most robust of all the species in cultivation, for its pseudobulbs are over three feet and sometimes over four feet in height—which forms the subject of our illustration is one of the novelties for whose introduction horticulture is indebted to Sir Everard im Thurn. It was met with by Sir Everard, when Governor of Fiji and High Commissioner of the Western Pacific, in the island of Efate, one of the New Hebrides, and was presented by him to the national collection at Kew on his return to Europe. It is, as Mr. Rolfe points out, most nearly allied to *D. antennatum*, Lindl., but is a much taller plant, with broader, thick and rigid leaves, with stouter pseudobulbs as thick as the human thumb, and with relatively shorter petals. *D. Imthurnii* is thus a very readily distinguishable species and one worthy to commemorate the services to science of its distinguished discoverer. At Kew the plant from which the material for our figure has been derived has thriven well in a tropical house; it flowered for the first time in September, 1911.

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DESCRIPTION.—*Herb*, epiphytic. *Pseudobulbs* clustered, stem-like, 3–4½ ft. high, about 1 in. thick at the base, somewhat narrowed upwards, leafy and with many nodes. *Leaves* distichous, elliptic-oblong, obtuse or apiculate, very coriaceous, 3–4 in. long, 1¾–2¼ in. wide. *Racemes* axillary, produced near the tops of the pseudobulbs, about 14 in. long, many-flowered, nearly erect. *Bracts* wide, triangular-ovate, acute, ¾–1½ in. long. *Pedicels* up to 2 in. long. *Flowers* of medium size, white, the lateral lobes of the labellum marked with lilac streaks. *Sepals*: the dorsal oblong-lanceolate, acute, somewhat spirally twisted, ¾ in. long; lateral sepals like the dorsal but with an oblique base prolonged as a triangular, acute mentum 5 lin. long. *Petals* somewhat spreading, linear, acute, narrowed to the base, slightly expanded and somewhat twisted upwards, 1¼–1½ in. long. *Labellum* 3-lobed, 1 in. long; lateral lobes oblong, obtuse, minutely crenulate; mid-lobe obovate-lanceolate, acute, minutely crenulate, ½ in. long, about ¼ in. wide; disk traversed longitudinally by 3 parallel lamellae which are dilated, truncate and finely crenulate near their anterior extremity. *Column* oblong, ¼ in. long.

Fig. 1, portion of the labellum; 2, column; 3, anther-cap; 4, pollinia; 5, sketch of an entire plant:—*all enlarged except 5, which is much reduced.*

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TAB. 8453.

COLUMNEA GLABRA.

Costa Rica.

GESNERIACEAE. Tribe CYRTANDREAE.

COLUMNEA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1009.

Columnea (Eucolumnea) **glabra**, *Oerst. Centralamericas Gesneraceer*, p. 62; *Hanst. in Linnaea*, vol. xxxiv. p. 408; species foliis elliptico-oblongis carnosis glabris, calycis segmentis erectis ligularibus distincta.

Fruticulus 0·5 m. altus, ramosus, caule crasso inferne circiter 1 cm. diametro, ramulis satis nodosis 3–4 mm. diametro inferne nudis superne foliatis, internodiis 0·4–2 cm. longis. *Folia* opposita, versus apices ramulorum aggregata, breviter petiolata, elliptico-oblonga, obtusa, 2·5–3 cm. longa, 1–1·4 cm. lata, carnosa, supra convexa nervo medio impresso, nervis lateralibus occultis, subtus pallidiora perinconspicue punctata, margine parce inconspicue ciliolata ceterum glabra. *Flores* singuli in axillis superioribus. *Pedicelli* basi bibracteati, 5–7 mm. longi. *Bracteae* ligulares, obtusae, circiter 8 mm. longae. *Calycis* segmenta erecta, ligularia, obtusa, 1·2–1·3 cm. longa, 4–5 mm. lata, parce pilosula. *Corolla* in alabastro apice acute cuspidata, in toto 7–7·5 cm. longa, extra pilis capitatis breviter inconspicue hirsuta; tubus 4–4·5 cm. longus, sursum sensim ampliatus; lobus anticus deflexus, lanceolatus, circiter 1·3 cm. longus, marginibus revolutis; lobi laterales e basi deltoidea angustati, retrorsi, marginibus revolutis; galea supra lobos laterales 1·5–2 cm. producta marginibus leviter reflexis. *Filamenta* inferne in vaginam brevem antice connata, minute pilosa; antherae oblongae, in quadram cohaerentes. *Disci* glandula unica, postica, 2 mm. longa, retusa. *Ovarium* sericeo-tomentosum; stylus glanduloso-pilosus. *Bacca* calyce persistente suffulta, alba, depresso-globosa, 1·3 cm. diametro, pubescens.—T. A. SPRAGUE.

The *Columnea* which we here figure is a native of Costa Rica, where it appears to be one of the commonest species of the genus, and is certainly one of the most beautiful. It is a native of the cooler mountain tracts, and has been recorded as occurring at altitudes of 5000–6000 feet above sea-level. In his work 'La subregion fitographica costaricense' Dr. Wercklé informs us that the Costa Rica Columneas may be segregated into pseudo-epiphytic species, with large leaves and insignificant flowers, and true epiphytes, with small leaves and large flowers. The latter group includes a few species whose stems creep along the stems and branches of trees, emitting at the nodes adventitious roots by which they are attached to the bark, and a larger group with free stems, sometimes, as in the case of *C. micro-*

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calyx, Hanst., pendulous from the branches which support them, at other times, as in the case of *C. glabra* here described, quite erect. The plant from which the material for our plate has been derived was acquired for the Kew collection from Mr. Lemoine in 1907. It has thriven well in an open compost, rich in humus, in a moist atmosphere kept at a temperature of 50°–60° F., and has formed a handsome shrublet about two feet high which is covered in spring with bright scarlet flowers. Propagation may be effected either by seeds or by cuttings. The seeds, however, are very minute and the young plants, which grow slowly, are difficult to raise. Cuttings, on the other hand, root readily in sandy peat and soon develop into shapely plants which flower freely while still quite small.

DESCRIPTION.—*Shrub*, up to 2 ft. high, branching above; stem about $\frac{1}{3}$ in. thick at the base, twigs nodose, $\frac{1}{6}$ in. thick, naked below, leafy upwards, internodes $\frac{1}{6}$–$\frac{3}{4}$ in. long. *Leaves* opposite, clustered towards the ends of the twigs, short-petioled, elliptic-oblong, obtuse, 1–1$\frac{1}{4}$ in. long, $\frac{1}{3}$–$\frac{1}{2}$ in. wide, fleshy, convex above with the midrib sunk, lateral nerves obscure, paler and very faintly punctate beneath, obscurely ciliolate along the margin, elsewhere glabrous. *Flowers* solitary in the upper axils; pedicels 2-bracteate at the base, $\frac{1}{5}$–$\frac{1}{4}$ in. long; bracts ligulate, obtuse, about $\frac{1}{3}$ in. long. *Calyx-lobes* erect, ligulate, obtuse, about $\frac{1}{2}$ in. long, $\frac{1}{5}$ in. wide, sparingly pilose. *Corolla* in bud acutely cuspidate, about 3 in. long when fully expanded, hirsute externally with short capitate hairs; tube 1$\frac{1}{2}$–1$\frac{3}{4}$ in. long, slightly widened upwards; anterior lobe deflexed, lanceolate, over $\frac{1}{2}$ in. long, its margins revolute; lateral lobes narrowed from a deltoid base, retrorse, their margins revolute; galea produced beyond the lateral lobes for $\frac{1}{2}$–$\frac{3}{4}$ in., its margins slightly reflexed. *Filaments* united below and in front in a short sheath, finely pilose; anthers oblong, cohering by their tips. *Disk* reduced to a solitary retuse posticous gland, 1 lin. long. *Ovary* silky-pubescent; style glandular-hairy. *Berry* supported by the persistent calyx, depressed-globose, white, pubescent, about $\frac{1}{2}$ in. across.

Fig. 1, calyx and pistil; 2, base of corolla-tube laid open, and stamens; 3 and 4, anthers; 5 fruit:—*all enlarged except 5, which is of natural size.*

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TAB. 8454.

BERBERIS VERRUCULOSA.

China.

BERBERIDACEAE. Tribe BERBERIDEAE.

BERBERIS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 43.

Berberis verruculosa, *Hemsl. et E. H. Wils. in Kew Bulletin*, 1906, p. 151; **affinis *B. pruinosae*, Franch., a qua ramis verruculosis differt.**

Frutex sempervirens, circiter 1 m. altus. *Rami* fulvi, dense verruculosi. *Ramuli* valde abbreviati, folia et flores pseudofasciculatim gerentes. *Folia primaria* spiniformia, trifurcata, 1–2 cm. longa, spinula multo minore utrinque saepe adjecta. *Folia ramulorum abbreviatorum* 3–5, breviter petiolata, elliptico-oblonga, utrinque angustata, 1·5–2·5 cm. longa, circiter 1 cm. lata, spinuloso-dentata dentibus utrinque 2–4, coriacea, glabra, supra nitida nervo medio et lateralibus leviter impressis, subtus pruinosa nervo medio prominulo. *Pedicelli* 4–5 mm. longi, basi bracteis pluribus imbricatis deltoideo-ovatis vel ovato-oblongis apiculatis usque ad 2 mm. longis carmineis circumdati. *Sepala* 6, petaloidea, lutea; exteriora ovato-orbicularia, 4 mm. longa; interiora suborbicularia circiter 6 mm. diametro. *Petala* 6, lutea, nectaria 2 gerentia, obovata, 6 mm. longa, 5 mm. lata, exteriora trilobata lobo medio parvo, interiora integra vel leviter emarginata; nectaria discreta, 0·75 mm. supra basin petalorum sita, oblonga, 1 mm. longa. *Stamina* 6, 4 mm. longa; filamenta crassa. *Ovarium* 4 mm. longum, vix 2 mm. diametro; stigma sessile, peltatum, ultra 2 mm. diametro. *Bacca* oblongo-ellipsoidea, circiter 1·3 cm. longa, cyaneo-purpurea, pruinosa.—T. A. SPRAGUE.

Berberis verruculosa, here figured, one of the most distinct and attractive of the newer Chinese species of the genus, was discovered in 1904 on the mountains around Tatien-lu, in Western Szechuan, by Mr. E. H. Wilson during his second expedition to China undertaken on behalf of Messrs. J. Veitch and Sons. It is most closely allied to *B. pruinosa*, Franch., a native of the province of Yunnan, but differs from that species in its verruculose branches and in having fewer and larger flowers. The material from which our plate has been prepared was obtained from a plant presented to the Kew collection by the Messrs. Veitch in 1909. *B. verruculosa* forms a sturdy low bush of dense habit with stiffly arched branches and dark lustrous foliage. It is apparently very hardy, and its neat habit and slow growth make it especially well adapted for the Rock Garden. It has not yet borne seeds freely, but it can be propagated by

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cuttings made of firm wood in August and placed in sandy soil under a cloche in some sheltered shady spot.

DESCRIPTION.—*Shrub*, evergreen, 3–4 ft. high; branches tawny, densely verruculose; twigs very short, bearing the clustered leaves and flowers. *Leaves*: primaries reduced to 3-furcate spines, $\frac{1}{3}$–$\frac{3}{4}$ in. long with frequently a much smaller additional spinule on each side; those of the abbreviated twigs 3–5, shortly petioled, elliptic-oblong, narrowed to both extremities, $\frac{2}{3}$–1 in. long, about $\frac{1}{3}$ in. wide, with 2–4 spinulous teeth on each side, coriaceous, glabrous, shining above with sunk midrib and lateral nerves, pruinose beneath with the midrib slightly raised. *Pedicels* $\frac{1}{6}$–$\frac{1}{5}$ in. long, surrounded at the base by numerous deltoid-ovate or ovate-oblong, apiculate, imbricate red bracts each about 1 lin. long. *Sepals* 6, petaloid, yellow; outer ovate-orbicular, 2 lin. long; inner suborbicular about 3 lin. wide. *Petals* 6, yellow, each with 2 nectaries, obovate, 3 lin. long, $2\frac{1}{2}$ lin. wide; outer 3-lobed with a minute mid-lobe, inner entire or slightly emarginate; nectaries distinct, oblong, small, adnate a little above the base of the petals. *Stamens* 6, 2 lin. long; filaments stout. *Ovary* 2 lin. long, under 1 lin. wide; stigma sessile, peltate, over 1 lin. across. *Berry* oblong-ellipsoid, about $\frac{1}{2}$ in. long, purplish-blue, pruinose.

Fig. 1, part of stem, showing verrucae; 2, leaf-spine and axillary short shoot; two leaves of the latter removed; 3, petal; 4 and 5, stamens; 6, pistil:—*all enlarged.*

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TAB. 8455.

CHIRONIA LAXA.

South Africa.

GENTIANACEAE. Tribe CHIRONIEAE.

CHIRONIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 805.

Chironia laxa, *Gilg in Engl. Bot. Jahrb.* vol. xxvi. p. 105; *Prain in Dyer, Fl. Cap.* vol. iv. pars 1, p. 1112; species *C. serpyllifoliae*, Lehm., quam maxime affinis sed foliis majoribus pro latitudine duplo longioribus apte distinguenda.

Herba ubique glabra, caulibus minopere angulatis, foliatis, laxe ramosis, 3–5 dm. longis, ramis patulis vel adscendentibus. *Folia* sessilia, opposita, membranacea, lanceolata, apice acuminata, basi rotundata, margine integra, obscure 3-nervia, 2–2·5 cm. longa, 2–3 mm. lata, viridia. *Flores* saepissime 2–3, nonnunquam singuli, ramulos terminantes et in axillis summis unilateraliter dispositi; pedunculi rigidiusculi, 1·2-3 cm. longi. *Calyx* anguste campanulatus, 5-partitus, 6 mm. longus; lobi lineari-subulati, tubo paullo longiores. *Corolla* purpureo-punicea, tubo anguste cylindrico calyce dimidio longiore, limbo angustato, lobis ovato-lanceolatis subacuminatis 10–12 mm. longis 4–5 mm. latis. *Stamina* exserta; antherae rectae, luteae. *Ovarium* anguste oblongum, acutum, 6 mm. longum, stylo gracili ovario longiore minopere declinato, stigmate 2-lobo.—*C. melampyrifolia*, E. Mey. Comm. p. 177, non Lamk. *C. Schlechteri*, Schoch in Bull. Herb. Boiss. sér. 2, vol. ii. p. 1110, et in Bot. Centralbl. Beih. xiv. 214.—D. PRAIN.

The genus *Chironia* includes about thirty-four species, of which twenty-five are natives of South Africa. Though nearly one-half of these have been from time to time introduced to European greenhouses, only two are generally met with in cultivation; these are *C. linoides*, Linn., figured at t. 511 of this work, which has been continuously in cultivation since the later years of the seventeenth century, and *C. floribunda*, Paxt., which has been generally grown since the middle of the nineteenth century. The disappearance of those which have not persisted has not been due to any serious difficulty connected with their cultivation, but has been owing to the fact that many appear to be monocarpic and that none of them readily ripen their seeds in this country. The species which flower more than once and can be propagated vegetatively are, therefore, the only ones that can be relied upon to continue in collections. The species now figured is a native of the Eastern region of the Cape Colony; its seeds

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were transmitted from Tembuland by Canon Mason to his brother Canon Mason, Master of Pembroke College, and made over to Mr. R. I. Lynch, Curator of the Cambridge Botanic Garden, where a plant flowered in June, 1911. Mr. Lynch finds that *C. laxa* is not difficult to grow if care be exercised; the chief danger to be avoided is injury by the Begonia mite, from which it may be guarded by the use of suitable insecticides. The best soil is a sandy loam, and good drainage must be provided, though watering need not be specially restricted. If the seed be sown early the plants may flower during the first year, but if sowing be delayed till summer good plants can be obtained which flower in the following year. Owing to its weak habit, three or four plants should be grown together in a 4½-inch pot. The nearest ally of *C. laxa* is *C. serpyllifolia*, Lehm., which we know from the seed-list of the Hamburg Botanic Garden to have been in cultivation there in 1828, but of which no subsequent cultural trace can be found. Whether it may be possible to establish *C. laxa* permanently it is as yet impossible to say. But even if it should disappear, there ought to be no insuperable difficulty in securing fresh importations of seeds not only of this but of other species of *Chironia* which are wild in South Africa, most of which are well worthy of a place, even if only temporarily, in our greenhouses.

DESCRIPTION.—*Herb*, everywhere glabrous; stems slightly angular, leafy, laxly branched, 1–1½ ft. long; branches ascending or spreading. *Leaves* opposite, sessile, membranous, lanceolate, acuminate, base rounded, margin entire, faintly 3-nerved from the base, ¾–1 in. long, 1–1½ lin. wide, green. *Flowers* showy, usually 2–3, sometimes solitary, terminal; peduncles ½–1¼ in. long, rather stiff. *Calyx* narrowly campanulate, 5-partite, 3 lin. long; lobes linear-subulate, rather longer than the tube. *Corolla* pale magenta, tube narrowly cylindric, half as long again as the calyx; limb contracted; lobes ovate-lanceolate, somewhat acuminate, 5–6 lin. long, 2–2½ lin. wide. *Stamens* exserted; anthers straight, yellow. *Ovary* narrow-oblong, acute, 3 lin. long; style slender, longer than the ovary, slightly declinate; stigma 2-lobed.

Fig. 1, calyx and pistil; 2, ovary in vertical section; 3 and 4, anthers; 5, pistil:—*all enlarged.*

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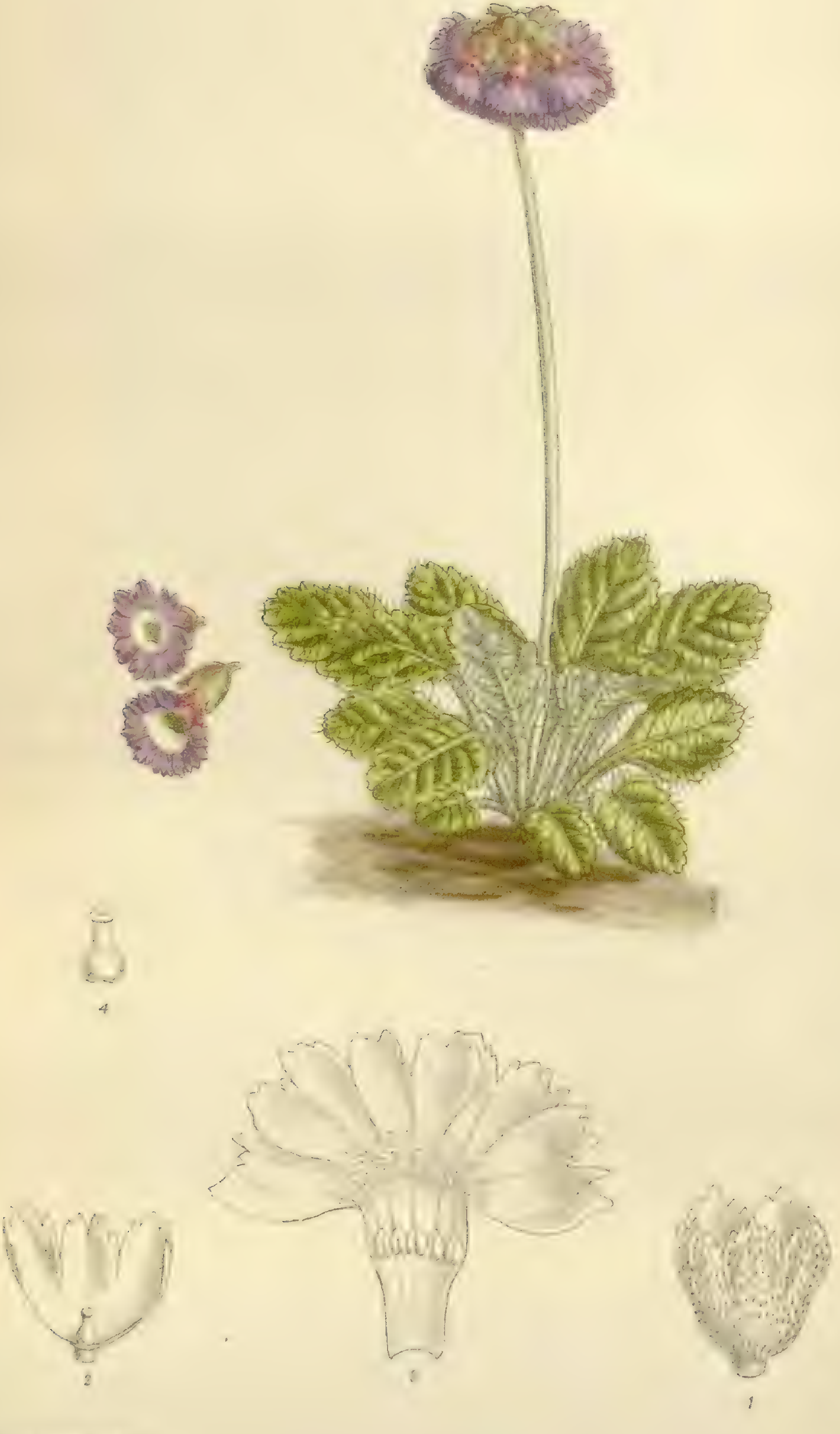

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TAB. 8456.

PRIMULA WATTII.

Himalaya.

PRIMULACEAE. Tribe PRIMULEAE.

PRIMULA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 631.

Primula Wattii, *King ex Watt in Journ. Linn. Soc.* vol. xx. p. 10 cum tab.; *Hook. f. in Fl. Brit. Ind.* vol. iii. p. 672; *Pax et Knuth in Engl. Pflanzenr.—Primulaceae*, p. 66; *Gard. Chron.* 1912, vol. li. p. 286, t. 138; ab affini *P. soldanelloide*, Watt, calycis lobis formae diversae haud integris distinguenda.

Herba nana. *Folia* oblonga vel oblongo-oblanceolata, apice obtusa, basi in petiolum angustata, 2·5 cm. longa, 1·5 cm. lata, grosse crenata, membranacea, efarinosa, pagina superiore pilis longis albidis plus minusve instructa, inferiore costa nervisque lateralibus pilis similibus instructa, nervis lateralibus utrinque circiter 6 cum nervis transversis supra impressis subtus prominentibus; petioli subalati, circiter 7 mm. longi, sparse longe albo-ciliati. *Scapus* circiter 10 cm. altus, capitulum e floribus numerosis pendulis constitutum gerens; bracteae parvae, lanceolatae vel fere rotundatae, membranaceae. *Calyx* majusculus, cupularis, corollae tubo subaequialtus, membranaceus, laxus, irregulariter lobatus, lobis irregulariter serratis, viridis et longitudinaliter brunneo-pictus. *Corollae* violaceae nisi fauce albo-farinosae tubus 5 mm. longus, limbus late campanulatus, 5-lobus, lobis fere cordatis irregulariter lobatis. *Antherae* oblongae, apiculatae, 1 mm. altae, filamentis vix 1 mm. longis. *Pistillum* 1 mm. altum, glabrum, ovario subgloboso stylo aequialto, stigmate late truncato-capitato.—W. G. CRAIB.

The *Primula* here figured was originally met with on the Cho-la range in Eastern Sikkim, where in certain localities it is abundant on banks and ridges, though, taken generally, it is rather rare. The plant from which our illustration has been prepared is one lent for the purpose by Messrs. R. Gill and Son, Falmouth. But it has also flowered in the Royal Botanic Gardens, Edinburgh, and at Kew, from seed presented by the Calcutta Botanic Garden in 1911 which had been collected by Mr. W. W. Smith in Sikkim during the autumn of the previous year. In this country it comes into flower in April or a little later; in the wild state, however, it does so from mid-July onwards into August under daily rain or heavy mist and in conditions hardly to be met with in Britain. *Primula Wattii*, with *P. Reidii*, Duthie, *P. soldanelloides*, Watt, and *P. uniflora*,

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Klatt, is a member of a very natural and well-marked coterie of the Soldanelloid group of Primulas. It is readily distinguished from its allies by the bronze tint of its buds, the very wide calyx with irregularly toothed lobes, the rather large white mealy eye, and the minute pistil. Like many other Primulas, *P. Wattii* is practically monocarpic; after flowering when about a year old the plants die or are too weak to flower a second time. For horticultural purposes such species have to be treated as annuals; unfortunately they do not always ripen seeds under cultivation.

DESCRIPTION.—*Herb.* *Leaves* membranous, green, oblong or oblong-lanceolate, obtuse, base narrowed to the petiole, margin coarsely crenate, 1 in. long, $\frac{2}{3}$ in. wide, with scattered long white hairs above and similar hairs on the midrib and nerves below; lateral nerves about 6 on each side, these like the midrib and the transverse veins sunk above, raised beneath; petiole almost winged, about $\frac{1}{3}$ in. long, sparingly ciliate with long white hairs. *Scape* about 4 in. high, bearing a many-flowered head of flowers; bracts small, lanceolate or almost rounded, membranous. *Calyx* rather large, cupular, about as long as the corolla-tube, membranous, loose, irregularly lobed, the lobes irregularly toothed, green with longitudinal brown streaks. *Corolla* violet with a white mealy eye; tube $\frac{1}{5}$ in. long; limb wide-campanulate, 5-lobed, the lobes subcordate and irregularly lobulate. *Anthers* oblong, apiculate, very small; filaments very short. *Pistil* very small, glabrous, subglobose; style about as long as the ovary; stigma widely truncate-capitate.

Fig. 1, calyx; 2, calyx in section, showing the minute pistil; 3, corolla laid open, showing the stamens and the white mealy eye; 4, pistil:—*all enlarged.*

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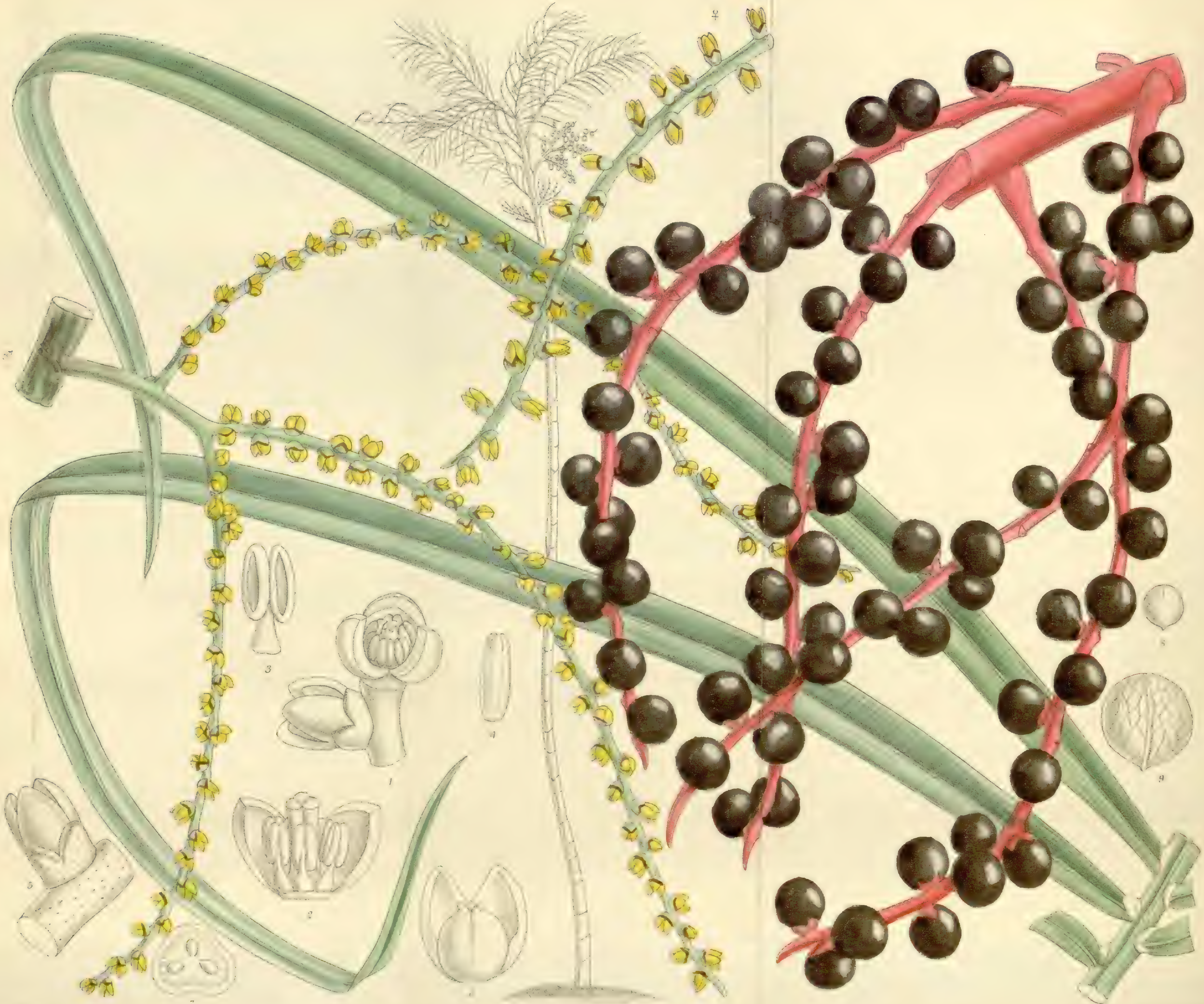

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TAB. 8457.

CHAMAEDOREA GLAUCIFOLIA.

Colombia?

PALMAE. Tribe **ARECEAE.**

CHAMAEDOREA, *Willd.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 910.

Chamaedorea glaucifolia, *H. Wendl.*, *Ind. Palm.* p. 64; *Gard. and Forest,* vol. viii. p. 504, fig. 70; species sectionis *Euchamaedoreae* distinctissima, **foliolis longe lineari-lanceolatis distinguitur.**

Caulis erectus, ad 4·5 m. altus, remote annulatus. *Folia* erecto-patentia glaucescentia, breviter vaginantia; foliola utrinque usque ad 40, irregulariter disposita, lineari-lanceolata, longissime acuminata, circiter 35 cm. longa, 12 mm. lata, basi incrassata, costa conspicua; rhachis supra acutangula, subtus convexa; petiolus supra canaliculatus, subtus convexus. *Panicula* dioica, mascula 4 dm. longa, ramis 2 dm. longis; spathae oblongae, acuminatae, 2·5 dm. longae, 2·5 cm. latae, glabrae. *Flores masculi*: *Calyx* 2 mm. longus, cupularis, breviter obtuseque dentatus, brunneo-marginatus. *Corolla* sessilis, 5 mm. longa, fere ad basin tripartita; lobi carnosi, acuti, concavi, valvati. *Stamina* 6, quam corolla paullo breviora; filamenta crassa, triangularia, antheris fere aequilonga. *Ovarii rudimentum* columnare, apice trifidum, staminibus superans. *Flores feminei*: *Calyx* corollaque iis florum masculorum similes. *Staminodia* nulla. *Ovarium* 3 mm. longum et latum, triangulare; stigmata 3, brevia, recurvata. *Paniculae fructigerae* rami et calyces corallini. *Fructus* globosus, 7 mm. diametro, atro-nitidus. *Semina* globosa; raphe conspicua; testa reticulata.—C. H. WRIGHT.

The elegant *Chamaedorea* which is here figured is one that has been in cultivation in the Aroid House at Kew for some forty years. In this house it has thriven well, but has formed a very slender stem too thin to support unaided the fine crown of elegant foliage which it bears. It flowers and fruits frequently, and the opportunity which presented itself in 1912 of obtaining flowers of both sexes was taken to provide this illustration. The genus *Chamaedorea* includes a considerable number of species mainly met with in the mountains of Central America, though a few extend as far to the south as the Andes of Peru and Bolivia. But as to the precise locality of *C. glaucifolia*, which is perhaps the most graceful of them all, there is an element of doubt. It was first described in 1854 by H. Wendland from a solitary male plant cultivated in the Brussels Botanic Garden and believed to have been introduced from pine woods near Chiapas in New Grenada. More recently, however, it has been stated to be a native of Guatemala,

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and it is to be noted that the most familiar Chiapas is the Mexican state which lies immediately to the north-east of Guatemala. When it was first introduced to cultivation small plants of *C. glaucifolia* were much in request as table plants and for other decorative purposes. The leaflets of *C. glaucifolia* bear some resemblance to those of *C. elegans*, Mart., a species which, however, belongs to the section *Collinia*, in which the petals are more extensively united than in *Euchamaedorea*, to which section Wendland has referred our plant, and with which, as regards its floral characters, it better agrees. It has, however, to be remarked that in *Euchamaedorea* most of the species have broad leaflets tapering to both ends and have the leaflets approximated in groups, a feature which is not very conspicuous in *C. glaucifolia.*

DESCRIPTION.—*Shrub*; stem erect, slender, reaching 15 ft. in height, distantly annulate. *Leaves* ascending below, spreading towards the apex, glaucescent, shortly sheathing; leaflets about 40 on each side, rather irregularly set, linear-lanceolate, very long acuminate, about 14 in. long, ½ in. wide, thickened at the insertion, midrib prominent; rhachis sharply angled above, convex beneath; petiole channelled above, convex beneath. *Panicles* 1-sexual, dioecious, the males 16 in. long, their branches 8 in. long; spathes oblong, acuminate, 10 in. long, 1 in. wide, glabrous. *Male*: *Calyx* 1 lin. long, cupular, shortly bluntly toothed, with brown edges. *Corolla* sessile, 2½ lin. long, 3-lobed almost to the base; lobes fleshy, acute, concave, valvate. *Stamens* 6, rather shorter than the corolla; filaments stout, triangular, about as long as the anthers. *Rudimentary ovary* columnar, 3-lobed, larger than the stamens. *Female*: *Calyx* and *corolla* as in the male flower. *Staminodes* 0. *Ovary* triangular, 1½ lin. long and about as much across; stigmas 3, short, recurved. *Fruiting panicles* with coral-red branches and calyces. *Fruit* globose, over ¼ in. in diameter, black, polished. *Seeds* globose, raphe conspicuous; testa reticulate.

Fig. 1, male flowers; 2, a male flower, one petal removed, showing anthers and rudimentary ovary; 3, anther; 4, rudimentary ovary; 5, a female flower; 6, the same, one petal removed, showing the ovary; 7, transverse section of ovary; 8 and 9, seeds:—*all enlarged except 8, which is of natural size.*

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TAB. 8458.

CEROPEGIA THORNCROFTII.

Transvaal.

ASCLEPIADACEAE. Tribe CEROPEGIEAE.
CEROPEGIA, *Linn.*; *Benth et Hook. f. Gen. Plant.* vol. ii. p. 779.

Ceropegia Thorncroftii, *N. E. Brown*; species nova affinis *C. crispatae*, N. E. Br., sed floribus multo minoribus lobis brevioribus et intra gibboso-carinatis differt.

Herba perennis, volubilis. *Radices* fasciculatae, carnosae, 10–14 mm. crassae, albae. *Caulis* 3–4 mm. crassus, glaber. *Folia* opposita, subcarnosa, glabra, viridia; petioli 6–10 mm. longi, 2–3 mm. crassi; laminae 2·5–5·5 cm. longae, 1·2–4 cm. latae, ovatae vel elliptico-ovatae, acutae, basi rotundatae vel late cuneatae, marginibus undulatis et plus minusve crispatis. *Cymae* axillares, pedunculatae, multiflorae; pedunculi 1·5–1·7 cm. longi, 2 mm. crassi, glabri. *Bracteae* minutae, 1–3 mm. longae, deltoideo-subulatae. *Sepala* 3–4 mm. longa, subulata, basi dilatata, glabra, purpureo-punctata. *Corolla* alba, purpureo-maculata, extra glabra; tubus 2·5 cm. longus, curvatus, intus pilosus, basi ellipsoideo-inflatus et 8 mm. diametro, superne 3 mm. diametro, cylindricus, fauce infundibuliformis et 8 mm. diametro; lobi 9–10 mm. longi, erecto-incurvati, apice connati, lineari-oblongi marginibus reflexis, intus ad medium gibboso-carinati et glabri, inferne parce pilosi. *Coronae exterioris* lobi adscendentes, 1 mm. longi, oblongi, subtruncati vel obtusi, fusco-purpureo-marginati, minute ciliati. *Coronae interioris* lobi 2 mm. longi, lineares, conniventes, subcohaerentes, fusco-purpurei, glabri. —N. E. BROWN.

The *Ceropegia* which forms the subject of our illustration is a native of the Transvaal, where it was discovered in the neighbourhood of Barberton by Mr. G. Thorncroft, to whom also horticulture is indebted for its introduction to European collections. Plants were sent by Mr. Thorncroft to the Botanic Garden, Cambridge, where it was flowered for the first time in August, 1911, by Mr. Lynch, to whom we are indebted for the material on which our figure has been based. When it flowered it was found to be an undescribed species and has been named in honour of its discoverer. *C. Thorncroftii* closely resembles *C. crispata*, N. E. Br., not only in its habit and as regards its foliage, but also in having a cluster of thick fleshy roots instead of a tuber. But while it is nearly allied to *C. crispata*, *C. Thorncroftii* differs markedly from that species in having much smaller flowers characterised by the gibbous projection at the middle of the keel on the inner side of the

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lobes, of which there is no trace in *C. crispata*. Mr. Lynch informs us that *C. Thorncroftii* requires the usual treatment under ordinary tropical conditions of the other species of the genus except that in winter it appears to demand a rather higher temperature than the majority, and to prefer a greater degree of dryness. It has done well in the Stove, but has not succeeded in the Cactus House. The masses of fleshy roots appear to be sensitive to any excess of moisture, especially if associated with too low a temperature.

Description.—*Herb*, twining, perennial; roots white, clustered, fleshy, $\frac{1}{3}$ in. thick; stem about $\frac{1}{8}$–$\frac{1}{6}$ in. thick, glabrous. *Leaves* opposite, somewhat fleshy, glabrous, green, ovate or elliptic-ovate, acute, base rounded or wide-cuneate, margin undulate and more or less crispate, 1–$2\frac{1}{4}$ in. long, $\frac{1}{2}$–$1\frac{3}{4}$ in. wide; petiole 3–5 lin. long, stout. *Cymes* axillary, peduncled, many-flowered; peduncles about $\frac{2}{3}$ in. long, 1 lin. thick, glabrous; bracts minute, deltoid-subulate. *Sepals* about $\frac{1}{6}$ in. long, subulate, wide-based, glabrous, dotted with purple. *Corolla* white with purple blotches, glabrous outside; tube 1 in. long, curved, pilose within, with an inflated ellipsoid base $\frac{1}{3}$ in. across, above cylindric and only $1\frac{1}{2}$ lin. wide, the throat funnel-shaped $\frac{1}{3}$ in. across; lobes over $\frac{1}{3}$ in. long, erect then incurved, their tips connate, linear-oblong with reflexed edges, within gibbously keeled and glabrous at the middle, sparingly pilose below the middle. *Outer corona* with ascending oblong subtruncate or obtuse lobes $\frac{1}{2}$ lin. long, which are finely ciliate and have dark-purple margins. *Inner corona* with linear, conniving, somewhat cohering dark-purple glabrous lobes 1 lin. long.

Fig. 1, calyx; 2, vertical section of corolla; 3, hairs from inner surface of corolla; 4, corona; 5, pollen-masses:—*all enlarged.*

8459

M.S. del, J.N. Fitch lith.

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TAB. 8459.

OSMANTHUS DELAVAYI.

China.

OLEACEAE. Tribe OLEINEAE.

OSMANTHUS, *Lour.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 677.

Osmanthus Delavayi, *Franch. in Bull. Soc. Linn. Paris*, vol. i. p. 613; affinis *O. suavi*, King ex C. B. Clarke, a quo foliis parvis plerumque argute serratis, floribus longioribus omnibus, ut videtur, terminalibus distat.

Frutex sempervirens, 2 mm. altus (ex Franchet), ramosus, cortice cinereo, ramulis hornotinis puberulis. *Folia* elliptica, utrinque acuta, vel obtusiuscula, margine argute serrata vel obsolete dentata (ex Franchet), circiter 1·5 cm. longa, 0·8-0·9 cm. lata, coriacea, glabra, supra saturate viridia, subtus pallidiora, glandulis oleiferis nigro-punctata; petioli 2 mm. longi, superne minute puberuli. *Florum* fasciculi terminales perulis late obovatis vel rotundatis 2–4 mm. longis scariosis ciliolatis suffulti; pedicelli puberuli, 2–5 mm. longi. *Calyx* tubuloso-campanulatus, paulo ultra medium 4-lobus, lobis rotundatis obtusis vel obtusissimis ciliatis. *Corolla* alba, glabra, odorata, tubo superne leviter ampliato 9–10 mm. longo, lobis obovato-ellipticis obtusis 4–5 mm. longis. *Stamina* medio tubo inserta, filamentis brevibus, antheris ovato-oblongis connectivo breviter apiculato. *Ovarium* ellipsoideum, stylo eo vix aequilongo, stigmate bilobo. *Drupa* (ex Franchet) ovato-subrotunda, nigro-caerulea.—O. STAPF.

The *Osmanthus* which is here figured is one of the most pleasing of new evergreen shrubs. It is named in honour of the late Abbé Delavay, by whom it was originally discovered in the mountains near Lankong, in Yunnan, at about 9500 feet above sea-level, and by whom it was introduced to cultivation through seeds sent to Mr. M. L. de Vilmorin. The species is now offered for sale by Messrs. Lemoine of Nancy and by Mr. Chanault of Orleans. The plant from which the material for our illustration has been derived is one purchased for the Kew Collection from Messrs. Lemoine which flowered in March, 1912. At Kew it thrives in a well-drained loamy soil and appears to be quite hardy. Besides being evergreen it has the advantage of being one of the earliest flowering of shrubs while its blossoms have a most delightful fragrance. In this respect it resembles its nearest ally, *O. suavis*, King, a native of Sikkim and Manipur, at elevations of 9000 feet or rather lower, which is, however, readily distinguished by its larger, more acute leaves and its somewhat smaller lateral as well

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as terminal flowers. *O. suavis*, which is not hardy at Kew, and *O. Delavayi* together constitute a distinct section of the genus, to which Mr. Franchet has given the name *Siphosmanthus*. *O. Delavayi* may be increased by late summer cuttings.

DESCRIPTION.—*Shrub*, 8 ft. high, evergreen, freely branching; bark grey; young shoots puberulous. *Leaves* elliptic, acute or somewhat obtuse, base cuneate or somewhat rounded, margin sharply serrate or sometimes obscurely toothed, about $\frac{2}{3}$ in. long, $\frac{1}{3}$ in. wide, coriaceous, glabrous, deep green above, rather paler beneath, dotted with dark oil-glands; petiole 1 lin. long, finely puberulous above. *Flowers* in terminal clusters, at first enclosed in wide ovate or rounded, scarious, ciliolate bud-scales 1–2 lin. long; pedicels puberulous, short. *Calyx* tubular-campanulate, 4-lobed rather beyond the middle; lobes rounded, blunt, ciliate. *Corolla* white, glabrous, fragrant; tube slightly widened upwards, over $\frac{1}{3}$ in. long; lobes obovate-elliptic, obtuse, about 2 lin. long. *Stamens* inserted about the middle of the corolla tube; filaments very short; anthers ovate-oblong with a shortly apiculate connective. *Ovary* ellipsoid, about as long as the style; stigma 2-lobed. *Fruit* ovate-rotund, very dark blue.

Fig. 1, calyx and pistil; 2, calyx, laid open, showing the ovary; 3, corolla, laid open, showing the stamens; 4 and 5, anthers:—*all enlarged.*

8460

M.S.del. J.N.Fitch lith.

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Tab. 8460.

ELSHOLTZIA Stauntoni.

China.

Labiatae. Tribe Satureineae.

Elsholtzia, *Willd.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1181.

Elsholtzia Stauntoni, *Benth. Lab.* p. 161, *et in DC. Prodr.* vol. xii. p. 160; *Hance in Journ. Linn. Soc.* vol. xiii. p. 85; *Franchet, Pl. David.* pars 1, p. 233 (forma puberula); *Forbes et Hemsl. in Journ. Linn. Soc.* vol. xxvi. p. 278; *Jack in Mitt. Deutsch. Dendr. Ges.* 1909, p. 288; *Hyde in Gard. Chron.* 1912, vol. li. p. 21, fig. 16; ab *E. polystachya*, Benth., floribus multo majoribus paniculas laxiores et latiores formantibus facile distinguenda.

Suffrutex graveolens. *Caules* erecti, 1–1·5 m. alti, subteretes, canescenti-tomentelli, apice valde ramosi. *Folia* petiolata, late lanceolata, 9–12 cm. longa, 2·5–3 cm. lata, superiora gradatim minora, longe acuminata, inciso-serrata, basi in petiolum sensim angustata, margine et venis primariis minute puberulis exceptis glaberrima, infra pallida et crebre glanduloso-punctata; petiolus 0·5–1·5 cm. longus. *Verticillastri* 5–10-flori, paniculas numerosas spiciformes laxas saepissime terminales subsecundas 7–15 cm., rarius ad 20 cm. longas formantes. *Bracteae* et *bracteolae* lanceolatae vel lineari-lanceolatae, saepe 2–4 mm. longae. *Pedicelli* 2–3 mm. longi, breviter pubescentes. *Calyx* tubulosus, 2·5–3 mm. longus, extra breviter albo-tomentosus, glanduloso-punctatus, 5-dentatus; dentes ovato-lanceolati, 1–1·75 mm. longi, subaequales, acuti. *Corolla* roseo-purpurea, circiter 7 mm. longa, extra breviter pubescens, glandulis sessilibus paucis instructa; tubus leviter incurvus, infundibuliformis, intus oblique annulato-pilosus; limbus leviter bilabiatus; labium superum erectum, profunde emarginatum, 1·5 mm. longum; labium inferum 3-lobatum, 2·5 mm. longum, lobis suborbicularibus intermedio concavo glabro 2 mm. longo quam ceteri majore. *Stamina* 4, glabra, longe exserta, duo antica longiora. *Stylus* glaber, longe exsertus, apice profunde 2-fidus. *Nuculae* laeves, ellipsoideae, disco denticulato antice valde producto circumdatae.—S. A. Skan.

The *Elsholtzia* here figured is probably, from the horticulturist's point of view, the best of the genus, which is now known to include about 36 species, mostly natives of India and China. Three species, distinct from the Asiatic, are known from Tropical Africa. Two of the Asiatic species have already been figured in this work, namely, *E. cristata*, Willd., at t. 2560, and *E. blanda*, Benth., under the name of *Aphanochilus blandus*, Benth., at t. 3091. The former is widely distributed, occurring in Northern Asia, China and Japan, and in the Temperate and Tropical Himalayas, and has even appeared in cultivated places in several parts of Northern Europe.

E. Stauntoni, the subject of our illustration, is apparently limited to the Province of Chihli in North China. Its

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introduction to cultivation was brought about by Mr. J. G. Jack of the Arnold Arboretum, who, during his visit to the Far East in 1905, obtained cuttings from some plants which he found growing on hills near the Great Wall, northwards of Nankow. The material from which our figure has been prepared has been derived from a plant presented to Kew by Professor Sargent of the Arnold Arboretum in 1910. The species has proved quite hardy at Kew, where it forms a shrub some five feet high in a border in the Arboretum where it flowers freely in September and October. The leaves are aromatic. Propagation may be effected by cuttings of the young shoots which root readily in a close frame in autumn.

Description.—*Undershrub*, aromatic. *Stems* erect, 4–5 ft. high, almost cylindric, faintly hoary-tomentose, much branched upwards. *Leaves* petioled, wide-lanceolate, 3½–4½ in. long, 1–1¼ in. wide, gradually diminishing in size upwards, long acuminate, margin incised-serrate, base gradually narrowed into the petiole, glabrous except on the margin and the main-nerves which are finely puberulous, rather pale and closely gland-dotted beneath; petiole ⅕–⅔ in. long. *Verticillasters* 5–10-flowered, arranged in numerous loosely spicate panicles which are usually subsecund and terminal and are from 3–6 in. or occasionally up to 8 in. long; bracts and bracteoles lanceolate or linear-lanceolate, 1–2 lin. long; pedicels about 1 lin. long, shortly pubescent. *Calyx* tubular, over 1 lin. long, shortly white-tomentose outside, gland-dotted, 5-toothed; teeth ovate-lanceolate, under 1 lin. long, acute, subequal. *Corolla* rose-purple, about ¼ in. long, shortly pubescent outside and with a few sessile glands; tube slightly incurved, funnel-shaped, with an oblique ring of hairs within; limb faintly 2-lipped, upper lip erect, deeply notched, under 1 lin. long, lower lip 3-lobed, over 1 lin. long, lobes suborbicular, the central glabrous outside, 1 lin. long, rather larger than the two lateral lobes. *Stamens* 4, glabrous, far exserted, the lower pair longer than the upper. *Style* glabrous, far exserted, deeply 2-fid. *Nutlets* smooth, ellipsoid, surrounded by a denticulate disk which is distinctly produced in front.

Fig. 1, bract; 2, flower; 3, corolla, laid open; 4 and 5, anthers; 6, ovary and disk:—*all enlarged.*

M.S. del. J.N. Fitch lith.

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TAB. 8461.

FURCRAEA ELEGANS.

Mexico.

AMARYLLIDACEAE. Tribe AGAVEAE.

FURCRAEA, *Vent.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 739.

Furcraea elegans, *Tod. Hort. Bot. Panorm.* p. 13, t. 4; *Baker, Handb. Amaryll.* p. 201; *J. R. Drummond in Rep. Missouri Bot. Gard.* 1907, pp. 45, 66, 74, t. 2; species ex affinitate *F. flavoviridis*, Hook., a qua foliis crassioribus spinis validioribus staminorumque filamentis brevius subulatis differt.

Suffrutex acaulis. *Folia* 40–50 rosulatim disposita, primum erecto-patula, demum patentia vel recurva, 2–2·35 m. longa, 10 cm. lata, longe lanceolata, basi pagina superiore tumida marginibus compressis, supra basin vix contracta, convexa, deinde gradatim plana, tertia suprema canaliculata, apice spina recta 1·5 cm. longa instructa, marginibus spinis antice curvatis subtriangularibus acuminatis armata, supra obscure viridia purpureo-marginata, subtus scabra. *Inflorescentia* 7·75 m. alta, gemmifera; pedunculus basi circiter 15 cm. diametro, fere ad basin ramiger; rami ad 1·7 m. longi, multiflori; bracteae lanceolatae; pedicelli 1 cm. longi, nutantes. *Perianthium* glabrum; tubus 2·2 cm. longus, extra demum brunneus; segmenta 3 cm. longa, ovata, intus pallide viridia, exteriora interioribus paullo angustiora, extra purpurea demum brunnescentia. *Filamenta* 1 cm. longa, fusiformia, apice breviter subulata; antherae oblongae, basi breviter cordatae. *Stylus* staminibus paullo longior, parte inferiore alte canaliculata, parte superiore cylindrica; stigma breviter trilobum.—*F. Ghiesbreghtii* et *F. pugioniformis*, Hort. Vershaffelt. ex Tod. Hort. Bot. Panorm. p. 13.—C. H. WRIGHT.

The fine *Furcraea* which forms the subject of our illustration is a native of Mexico, which has been known in European collections for many years. It was first described by the late Professor Todaro from a plant which flowered in the Botanic Garden at Palermo in 1875, and is distinguished from all the other species which have a very short stem or are quite stemless, by the size of its leaves which at times attain a length of nearly eight feet. Its nearest ally in the genus is *F. flavoviridis*, Hook., figured at t. 5163 of this work, which however has thinner leaves with more slender marginal spines and has the upper subulate portion of the filaments as long as the lower swollen part. Another ally is *F. undulata*, Jacobi, figured at t. 6160 of the Botanical Magazine; this latter, however, is a much smaller plant, with the leaves conspicuously contracted just above the base, while the inflorescence is unbranched in its

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lower portion. At Kew *F. elegans* has long been in cultivation and has thriven well in the Succulent House under the treatment suitable for Agaves and other species of *Furcraea*. Here, however, it has not yet flowered, and the material for our figure has been obtained from a plant which flowered in the garden of Lady Hanbury at La Mortola, Ventimiglia, in March, 1912. When communicating this material Mr. A. Berger also kindly supplied excellent photographs which show the habit of the plant. In this La Mortola plant the exterior of the flower was more highly coloured than in the Palermo specimen depicted in Todaro's original figure, where the brownish tint is but slightly indicated.

DESCRIPTION.—*Undershrub*, stemless. *Leaves* 40–50, rosulate, at first ascending, ultimately spreading or recurved, 6½–8 ft. long, 4 in. wide, narrow lanceolate, swollen at the base on the upper side with the margins there compressed, above the base hardly at all contracted, convex at first then by degrees flat and in the upper third channelled, armed at the tip with a straight spine nearly ⅔ in. long and along the margins with somewhat triangular acuminate spines which curve forwards, dull green with purplish margins on the upper surface, scabrid on the lower surface. *Inflorescence* up to 25 ft. in height, bulbiferous; peduncle about 6 in. thick at the base, branching throughout; branches up to 5½ ft. long, many-flowered; bracts lanceolate; pedicels ⅖ in. long, nodding. *Perianth* glabrous; tube over ¾ in. long, pale purple at length brownish outside; lobes 1¼ in. long, ovate, very pale green within, the outer rather narrower than the others, purple at length brownish outside. *Filaments* ⅖ in. long, fusiform, with shortly subulate tips; anthers oblong, slightly cordate at the base. *Style* rather longer than the stamens, channelled below, cylindric above; stigma shortly 3-lobed.

Figs. 1 and 2, stamens; 3, style:—*all enlarged.*

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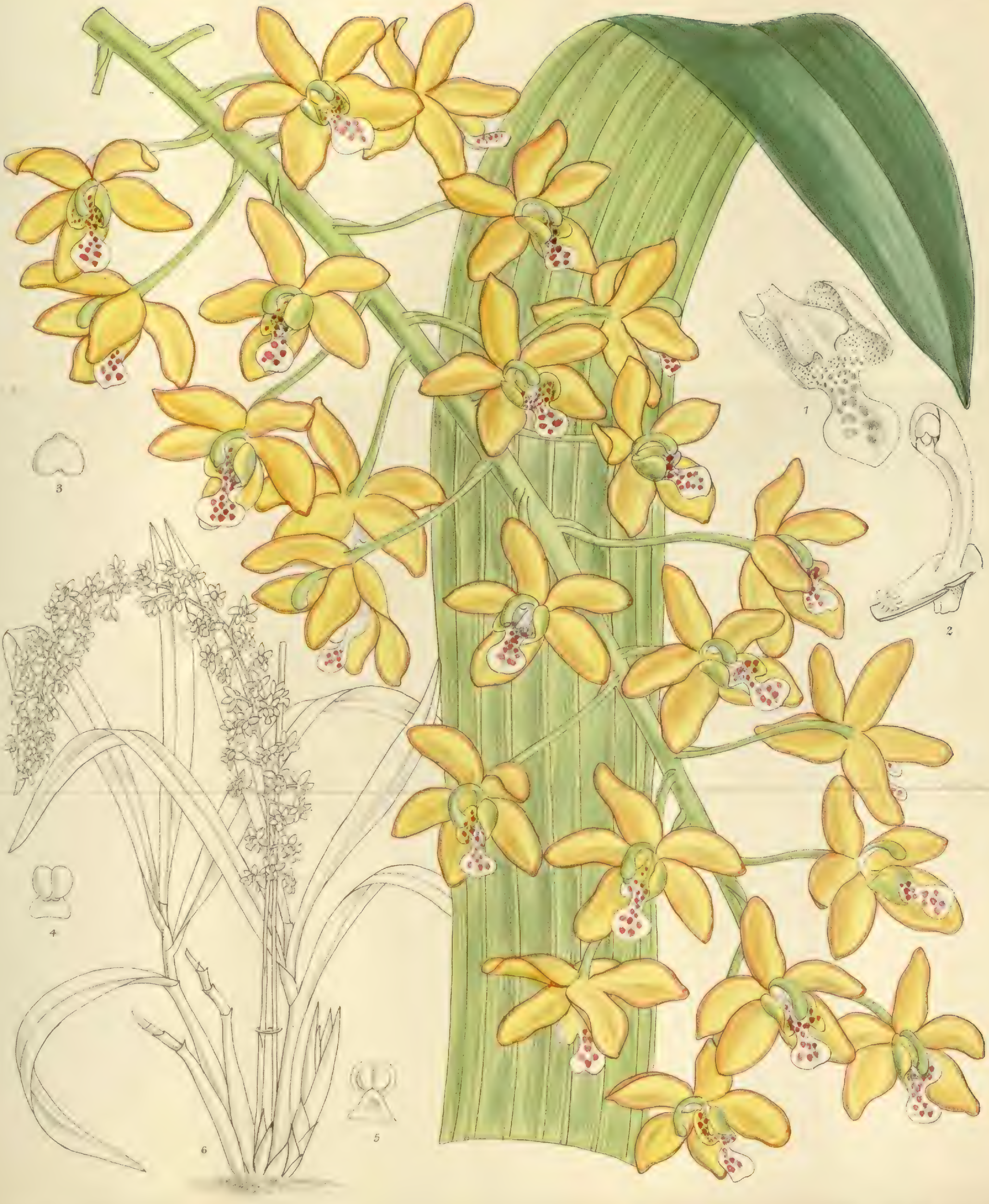

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Tab. 8462.

ERIOPSIS Helenae.

Peru.

Orchidaceae. Tribe Vandeae.

Eriopsis, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 545.

Eriopsis Helenae, *Kränzl. in Gard. Chron.* 1897, vol. xxii. p. 98; affinis *E. sceptri,* Reichb. f. et Warscew., sed labelli lobo intermedio breviter unguiculato et lamellis duplo latioribus differt.

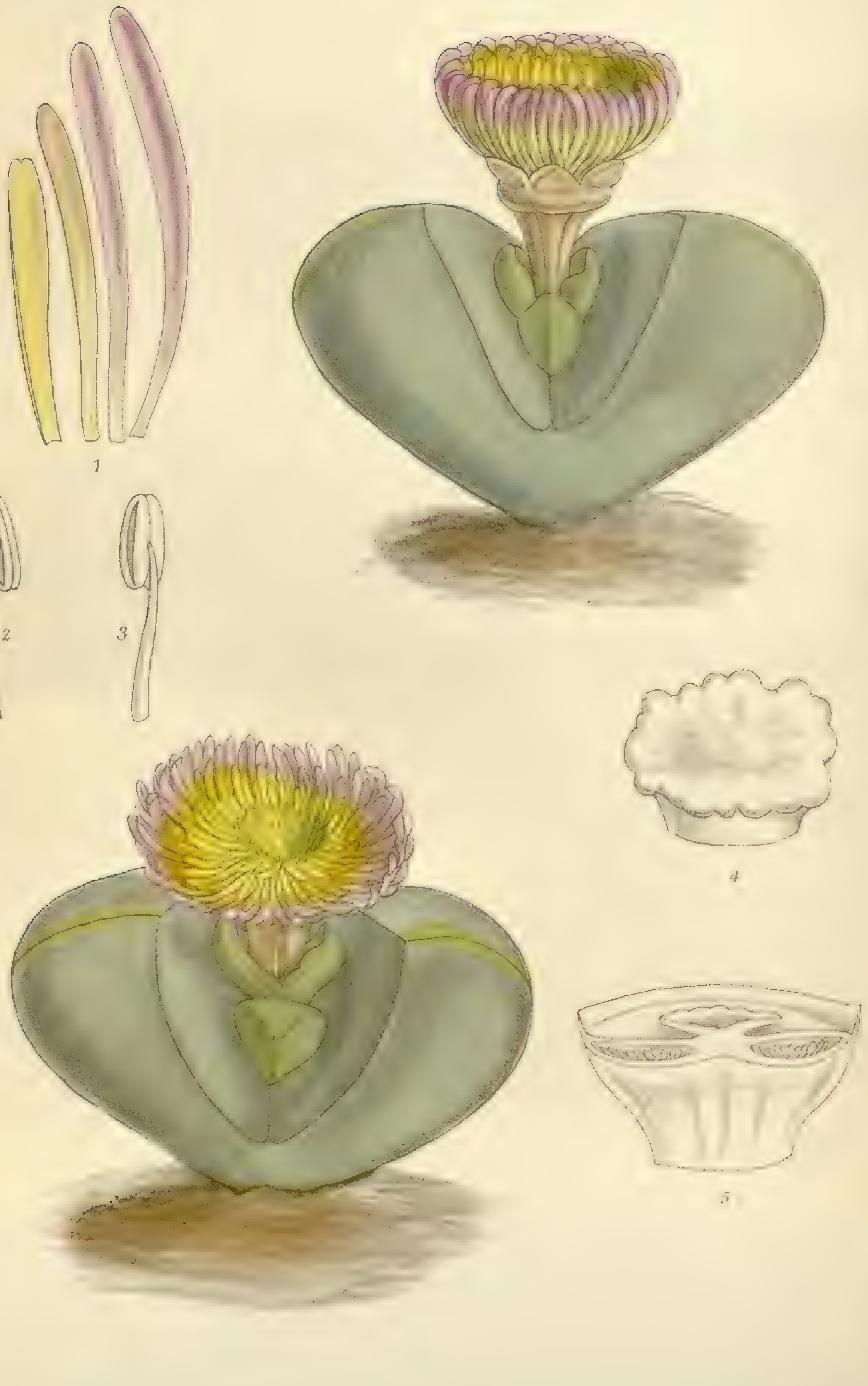
Herba epiphytica, 50–60 cm. alta. *Pseudobulbi* subteretes, elongati, erecti, 15–25 cm. longi, apice 3–4-phylli. *Folia* elongato-oblonga, subacuta, arcuata, coriacea, 40–55 cm. longa, 2·5–3·5 cm. lata. *Scapi* erecti, arcuati, circiter 60 cm. longi; racemi laxi, multiflori. *Bracteae* lanceolato-oblongae, breves. *Pedicelli* graciles, 3–4 cm. longi. *Flores* mediocres. *Sepala* et *petala* patentia, oblonga, obtusa, circiter 2 cm. longa, ochracea, brunneo-marginata. *Labellum* trilobum, circiter 1·5 cm. longum; lobi laterales transverse oblongi, obtusi, incurvi, ochracei; lobus intermedius obovato-spathulatus, obtusus, suberectus, albus, purpureo-maculatus; discus puberulus, lamellis triangulari-oblongis supra inter lobos laterales divergentibus. *Columna* clavata, circiter 1 cm. longa, viridia; pollinia 4, inaequalia, anthera glandulae dehiscenti squamiformi affixa.—R. A. Rolfe.

The orchidaceous genus *Eriopsis*, Lindl., includes about six species, all South American, and extends from Guiana and Colombia to Northern Brazil and Peru. One of these species, *E. rutidobulbon*, Hook., has already been figured at t. 4437 of this work. The species now figured, *E. Helenae*, Kränzl., is a native of Peru, whence it was introduced by Messrs. Sander and Sons, in whose establishment at St. Albans it flowered for the first time in 1897 and provided the material on which Dr. Kränzlin's original description was based. In 1894 Messrs. Sander presented one of their plants to the Royal Botanic Gardens, Kew, where it throve well in a tropical house under the conditions suitable for species of *Dendrobium*, but did not flower until June, 1909, when it afforded the material from which our illustration has been prepared. Unfortunately the exhaustion resulting from the production of its striking inflorescence was so severe that the plant has since succumbed.

November, 1912.

DESCRIPTION.—*Herb*, epiphytic, $1\frac{1}{2}$–2 ft. high; pseudobulbs subterete, elongated, erect, 6–10 in. long, with 3–4 subterminal leaves. *Leaves* elongate-oblong, subacute, curved, very firm, 16–22 in. long, 1–$1\frac{1}{4}$ in. wide. *Scapes* erect, curved upwards, about 2 ft. long; racemes lax, many-flowered; bracts lanceolate-oblong, short; pedicels slender, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long. *Flowers* of medium size. *Sepals* and *petals* similar, spreading, oblong, obtuse, about $\frac{3}{4}$ in. long, dull yellow with brown margins. *Labellum* 3-lobed, about $\frac{2}{3}$ in. long; lateral lobes transversely oblong, obtuse, incurved, dull yellow; mid-lobe obovate-spathulate, obtuse, suberect, white with bright purple spots; disk puberulous, its lamellae triangular-oblong, diverging above between the lateral lobes. *Column* clavate, about 5 lin. long, green; pollinia 4, unequal, anther attached to a separable scale-like gland.

Fig. 1, lip; 2, column, showing attachment; 3, anther-case; 4 and 5, pollinarium seen from in front and from behind; 6, sketch of an entire plant: *all enlarged except* 6, *which is much reduced.*



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Tab. 8463.

MESEMBRYANTHEMUM PEARSONII.

South Africa.

Ficoideae. Tribe Mesembryeae.

Mesembryanthemum, Linn.; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 853.

Mesembryanthemum Pearsonii, *N. E. Brown in Kew Bulletin*, 1912, p. 277; affinis *M. testiculari*, Ait., sed foliis multo majoribus, calyce supra folia exserto et floribus bicoloribus differt.

Herba perennis succulenta, 4-5 cm. alta. *Folia* 2, basi connata, patulo-adscendentia, 3·5–4 cm. longa, 4·5 cm. lata, 2·5 cm. crassa, facie interiora subplana, marginibus subacutis, subtus vel dorso subgibboso-convexa et leviter carinata, vertice leviter convexa, obtusissima, laevissima, glabra, alba, haud glauca. *Flos* solitarius, inter folia terminalis. *Pedunculus* exsertus, 2·5 cm. longus, validus, compressus, erectus, quadri-bracteatus, glaber. *Bracteae* inferiores 1·5 cm. longae, 0·8 cm. latae, 0·8 cm. crassae, subacute trigonae, obtusae, superiores minores, laeves, glabrae, albidae. *Calyx* 1·3 cm. diametro, 6-lobus, glaber; lobi 3–4 mm. longi, 5 mm. lati, latissime ovati, obtusi. *Corolla* 3–3·2 cm. diametro, bicolor; petala 3–4-seriata; exteriora circiter 1·3 cm. longa, linearia, obtusa, pulchre purpurea; interiora gradatim minora, subochraceo-lutea, rubro-striata. *Stamina* numerosissima, patula, in annulum congesta; filamenta alba; antherae pallide luteae. *Styli* nulli; stigmata sessilia, magna, 5 mm. diametro, disciformia, obscure crenata.—N. E. Brown.

The very distinct and striking *Mesembryanthemum* of which a figure is given here, was collected in 1910 by Mr. Pillans on the eastern slope of a ridge about twelve miles south of Nieuwerust, during the expedition to the Orange River led on behalf of the Percy Sladen Trustees by Professor Pearson. The plant was received at Kew from Professor Pearson, in whose honour it is named, in the spring of 1911, and flowered in a sunny frame during the summer of the same year, thereby allowing the preparation of our illustration. As a species it is most closely allied to *M. testiculare*, Ait., but the leaves are nearly twice as large and the calyx is exserted to about the level of the leaf-tips. In habit, size and form it also approaches *M. Bolusii*, Hook. f., but it differs very markedly in having smooth

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and very white, though not glaucous, leaves as well as in having more exserted flowers and in being without any style. In the absence of a style and in having a large sessile discoid stigma, *M. Pearsonii* differs from all other species known to Mr. Brown by their flowers, though it is not impossible that in *M. testiculare*, of which flowers have not been seen, the same arrangement may exist. The flowers of *M. Pearsonii* appear to expand at night or in the very early morning, becoming more or less closed during the day. In colour they are somewhat peculiar, two or three of the inner series of petals being of a dull yellow colour, more or less streaked with purple, the petals of the outermost series being entirely mauve-purple. In cultivation *M. Pearsonii* requires the conditions suited to *M. Bolusii*, *M. testiculare* and the other species which have very thick succulent leaves.

DESCRIPTION.—*Herb*, perennial, succulent, 1½–2 in. high. *Leaves* 2, connate at the base, between ascending and spreading, 1¼–1½ in. long, 1¾ in. wide, 1 in. thick, almost flat on the inner face, somewhat gibbously convex and slightly keeled on the outer, the margin subacute, the apex slightly convex, quite blunt, everywhere quite smooth, glabrous, whitish but not glaucous. *Flower* solitary, terminal between the leaves; peduncle exserted, 1 in. long, stout, compressed, erect, 4-bracteate, glabrous; lower bracts ⅔ in. long, ⅓ in. wide and ⅓ in. thick, somewhat sharply trigonous, obtuse; the upper bracts smaller, smooth, glabrous, whitish. *Calyx* ½ in. wide, 6-lobed, glabrous; lobes ⅛–⅙ in. long, ⅕ in. wide, very broadly ovate, obtuse. *Corolla* about 1¼ in. across; petals 3–4-seriate, the outer about ½ in. long, linear, obtuse, mauve-purple; the inner progressively smaller, somewhat dull yellow streaked with purple. *Stamens* very many, spreading, clustered in a ring; filaments white; anthers pale yellow. *Style* 0; stigma large, discoid, obscurely crenate, ⅕ in. across.

Fig. 1, petals; 2 and 3, stamens; 4, stigma; 5, ovary in vertical section:—*all enlarged.*

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TAB. 8464.

CORNUS CONTROVERSA.

Himalaya and Eastern Asia.

CORNACEAE. Tribe CORNEAE.

CORNUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 950; *Wang. in Engl Pflanzenr.* vol. iv. no. 229, p. 43.

Cornus controversa, *Hemsl. ex Prain in Bot. Mag.* t. 8261 *et in Kew Bull.* 1909, p. 331; *Wang. in Engl. Pflanzenr.* vol. iv. no. 229, p. 49; *Koehne, Mitt. Deutsch. Dendrol. Gesellsch.* 1909, p. 185; ab altera specie sectionis *Bothrocaryi*, Koehne, foliis majoribus, inflorescentia ampliore post anthesim magis distracta, putaminis fovea apicali pro rata minore distincta.

Arbor 9–12 m. alta, ramis novellis glabris vel raro parce pilosulis rubescentibus vel nigricantibus. *Folia* alterna, lamina elliptica vel ovato-elliptica, saepe lata, basi acuta vel rotundata, apice acute acuminata, 8–15 cm. longa, 5–8 cm. lata, supra saturate viridia, infra magis minusve glauca, primo utrinque adpresse pilosa, superne cito glabrata, pilis medio-fixis arcte adpressis, nervis lateralibus utrinque 6–7 valde obliquis conspicuis; petiolus 2–7 cm. longus. *Inflorescentia* corymbosa, pedunculo 2–3 cm. longo suffulta, percomposita, ad 18 cm. diametro, fructifera divaricato-distracta, laxa, ramis ramulisque hirtellis, pedicellis 3-5 mm. longis. *Flores* albi, 8–12 mm. diametro. *Receptaculum* dense argenteo-incano-pilosum. *Sepala* minuta, triangularia, discum vix aequantia. *Petala* oblonga vel lanceolato-oblonga, acuta, dorso parce pilosula. *Filamenta* petalis paulo longiora; antherae 1·5–2 mm. longae. *Stylus* glaber, 1·75–2·5 mm. longus. *Drupa* globosa, 6–8 mm. diametro, nigrescens; putamen leviter costulatum, apice foveola vix trientem diametri aequante excavatum.—*C. macrophylla*, Wall. Cat. n. 469 partim; C. B. Clarke in Hook f. Fl. Brit. Ind. vol. ii. p. 744 partim; Forbes et Hemsl. in Journ. Linn. Soc. vol. xxiii. p. 345 partim; Koehne in Gartenfl. vol. xlv. p. 285, fig. 1 a–c et vol. xlvi. p. 96 et in Mitt. Deutsch. Dendr. Gesellsch. 1903, p. 36; Shirasawa in Ess. Forest. Ic. t. 77, fig. 13–23; Harms in Engl. Bot. Jahrb. vol. xxix. p. 506; non Wall. in Roxb. *C. brachypoda*, K. Koch, Dendr. vol. i. p. 685 partim; Koehne, Dendrol. p. 435; non C. A. Mey. *C. glauca*, Blume ex K. Koch l.c. partim; Koehne in Gartenfl. vol. xlv. p. 286 et vol. xlvi. p. 96. *Corni species 2 alternifoliae*, S. Moore in Journ. Bot. vol. v. p. 292.—O. STAPF.

The *Cornus* here figured is one of the most elegant of small deciduous trees in cultivation; it has a slender erect stem with horizontal branches in tiers a foot or more apart. Its alternate leaves distinguish *C. controversa*, Hemsl., from all other Cornels except the American *C. alternifolia*, Linn. f., a species easily recognised by its fewer pairs of nerves. The plant from which our figure was prepared was obtained from Messrs. J. Veitch and Sons. The confusion between

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this species and *C. brachypoda* has been dealt with by Mr. Hemsley under *C. macrophylla*, Wall., at t. 8261 of this work; of the two forms to which the name *C. brachypoda* has been applied Mr. Hemsley has treated the one with alternate leaves, now figured, as distinct, and has referred that with opposite leaves to *C. macrophylla.* Dr. Koehne who, twelve years earlier, had studied the question, accepts for our plant the name *C. controversa* proposed by Mr. Hemsley, in preference to the name *C. macrophylla* which he had then applied to it, but now treats the Himalayan opposite-leaved Cornel as distinct from the one of China and Japan; for this last he employs the name *C. brachypoda*, C. A. Mey. In this he has been followed by Dr. Wangerin. However this may be, the fact has been definitely established that the alternate-leaved *C. controversa* here figured is distinct alike from *C. macrophylla* and *C. brachypoda.* In cultivation in this country *C. controversa* is quite hardy. It needs a good loamy soil and abundant moisture to bring out its characteristic beauty. It may be increased both by cuttings and by layers, but it is preferable to propagate from seeds if these can be obtained.

DESCRIPTION.—*Tree*, 30–40 feet high, twigs glabrous or rarely sparingly pilose, reddish or blackish. *Leaves* alternate, elliptic or ovate-elliptic usually rather broad, base acute or rounded, apex sharply acuminate, 3–6 in. long, 2–3 in. wide, dark green above, more or less glaucous beneath, at first adpressed hairy on both sides but soon glabrous above, hairs attached mesially, lateral nerves 6–7 on each side, oblique, distinct; petiole $\frac{3}{4}$–$2\frac{1}{4}$ in. long. *Inflorescence* corymbose, much branched, up to 7 in. wide, peduncle $\frac{3}{4}$–$1\frac{1}{4}$ in. long; in fruit divaricately explanate, lax, the ramifications finely hairy, the pedicels $1\frac{1}{2}$–$2\frac{1}{2}$ lin. long. *Flowers* white, $\frac{1}{3}$–$\frac{1}{2}$ in. across. *Receptacle* densely white-pilose. *Sepals* minute, triangular, hardly as long as the disk. *Petals* oblong or lanceolate-oblong, acute, sparingly puberulous on the back. *Filaments* rather longer than the petals; anthers about 1 lin. long. *Style* glabrous, about 1 lin. long. *Drupe* globose, 3–4 lin. wide, blackish, stone slightly ribbed, with an apical foveola hardly one-third the width of the stone.

Fig. 1, bud; 2, flower; 3 and 4, anthers; 5, portion of a corymb in fruit:—*all enlarged except 5, which is of natural size.*

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Tab. 8465.

IRIS caroliniana.

Virginia and Carolina.

Iridaceae. Tribe Irideae.

Iris, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 686.

Iris caroliniana, *S. Wats. in A. Gray, Man.* ed. vi. p. 518, *et in Proc. Am. Acad.* vol. xiv. p. 134; *Sargent in Gard. & For.* vol. vi. p. 334, fig. 51; *Britt. & Brown, Ill. Fl. N. Unit. Stat.* vol. i. p. 449 *cum ic.*; species *I. versicolori*, Linn., affinis sed foliis viridibus nec glaucis, florum majorum colore lavandulaceo vel lavandulaceo-purpureo et seminibus magnis in unoquoque loculo 1-seriatis differt.

Herba rhizomate crasso. *Folia* basalia ensata, acuta, ad 90 cm. longa, 1·5–3 cm. lata, laete viridia, laevia, subtenuia, nervis tenuibus mediis 2–3 quam caeteris magis conspicuis. *Caulis* subgracilis, 40–60 cm. altus, simplex vel rarius parce ramosus, 1-foliatus folio flores attingente basalibus simili nisi angustiore, 2–3-florus. *Spathae* lanceolatae, acutae, 3·5–4 cm. longae, tenuiter scarioso-herbaceae, interdum fusco-suffusae. *Pedicelli* inaequales, sub anthesi spathis breviores vel eas aequantes, longiores demum exserti. *Perianthii* tubus viridis, fusco-suffusus, 6–8 mm. (ex auctoribus ad 12 mm.) longus; segmenta exteriora 5·5 cm. longa, limbo descendente obovato 3 cm. longo 2·2–2·3 cm. lato lavandulaceo vel lavandulaceo-purpureo distincte purpureo-venoso basin versus ad latera albido medio lutescente, ungue 2·5 cm. longo explanato 7–8 mm. lato viride-luteo purpureo-venoso; segmenta interiora erecta, oblongo-lanceolata in unguem gracilem sensim attenuata, 3·5–3·7 cm. longa, 11 mm. lata, lavandulacea vel lavandulaceo-purpurea. *Filamenta* 6 mm. longa; antherae albidae, 13 mm. longae. *Ovarium* 11–12 mm. longum, subteres; styli rami oblanceolato-lineares, cristae lobis dentatis oblique ovatis exclusis 3 mm. longis. *Capsula* ambitu oblonga, obtusissime triquetra, 3·5–4·5 cm. longa, ad 2 cm. diametro. *Semina* applanata, crassiuscula, 8–10 mm. diametro, in unoquoque loculo 1-seriata, fusca.—O. Stapf.

The interesting *Iris* which forms the subject of our illustration was first discovered by Mr. W. A. Manda near Wilmington, in North Carolina, and flowered for the first time in cultivation in the Harvard Botanic Garden, when it was described by the late Mr. S. Watson. While botanically very closely allied to *I. versicolor*, Linn., the plant now described, *I. caroliniana*, S. Wats., is horticulturally very distinct, and the two are readily discriminated by the characters to which Dr. Stapf has called attention.

November, 1912.

At Kew *I. caroliniana* has been in continuous cultivation for some ten years past, growing well and flowering freely every year in the Rock Garden. A native of swampy places it shows, even under cultivation, a predilection for swampy conditions, and if these be provided it sets seeds freely. In 1908 a fresh supply of seeds was presented to Kew by the Missouri Botanic Gardens, and from one of the plants so obtained has been derived the material for our plate.

DESCRIPTION.—*Herb*, rootstock stout. *Leaves* at the base ensate, acute, up to 3 ft. long, $\frac{2}{3}$–$1\frac{1}{4}$ in. wide, bright green, smooth, rather thin, with 2–3 mesial nerves rather stronger than the others. *Stem* rather slender, $1\frac{1}{2}$–2 ft. high, simple or rarely sparingly branched, 1-foliate, the stem-leaf reaching the flowers, like the basal leaves but narrower; flowers 2–3. *Spathes* lanceolate, acute, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, thinly scarious-herbaceous, sometimes tinged with brown. *Pedicels* unequal, shorter than or equalling or exceeding the spathes. *Perianth-tube* green, tinged with brown, $\frac{1}{4}$–$\frac{1}{3}$ in. or, according to S. Watson, sometimes $\frac{1}{2}$ in. long; outer segments over 2 in. long, the limb dependent, obovate, over 1 in. long, under 1 in. wide, lavender or lavender-purple, with darker purple veins, the base white towards the sides and yellowish in the centre, claw 1 in. long, when spread flat about $\frac{1}{3}$ in. wide, greenish-yellow with purple veins; inner segments erect, oblong-lanceolate, gradually narrowed into a slender claw, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, under $\frac{1}{2}$ in. wide, lavender or lavender-purple. *Filaments* $\frac{1}{4}$ in. long; anthers whitish, over $\frac{1}{2}$ inch long. *Ovary* about $\frac{1}{2}$ in. long, subterete; style-arms oblanceolate-linear, excluding the toothed obliquely ovate lobes of the crest about $1\frac{1}{4}$ in. long. *Capsule* oblong, very bluntly 3-quetrous, $1\frac{1}{2}$–$1\frac{3}{4}$ in. long, $\frac{3}{4}$ in. across. *Seeds* flattened, rather thick, about $\frac{1}{3}$ in. across, 1-seriate in each loculus, brown.

Figs. 1 and 2, anthers; 3, a stigmatic lobe:—*all enlarged.*

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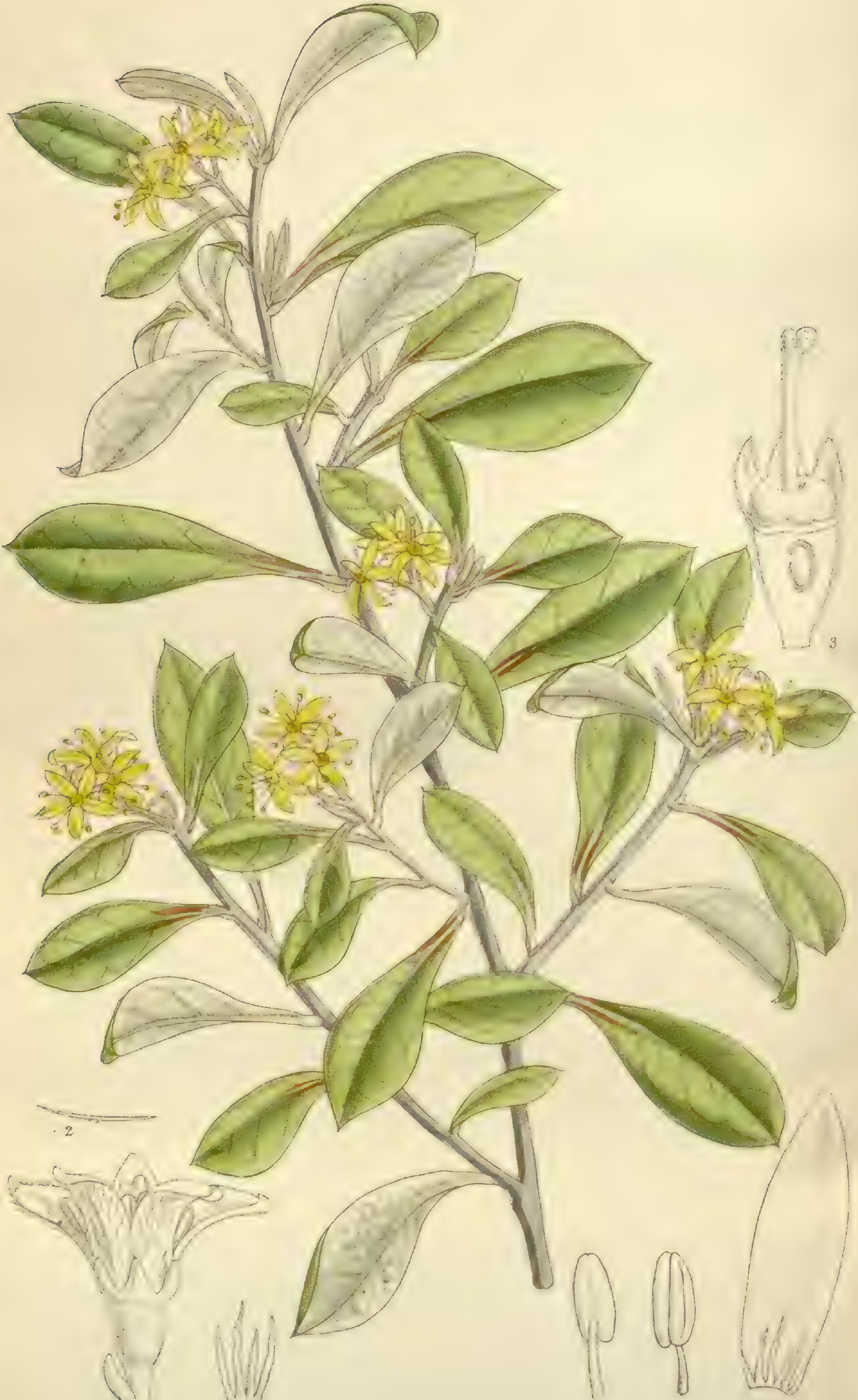

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Tab. 8466.

COROKIA VIRGATA.

New Zealand

Cornaceae. Tribe **Corneae.**

Corokia, *A. Cunn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 949.

Corokia virgata, *Turrill*; species *C. Cotoneaster*, Raoul, valde affinis sed foliis majoribus ramis haud divaricato-tortuosis petalorumque squamulis diversis differt.

Frutex 2·5 m. altus, ramosus; ramuli teretes haud divaricato-tortuosi, juniores albo-tomentosi mox glabrati fusco-brunnei. *Folia* alterna, oblongo-spathulata, apice acuta, minute apiculata, ad 4·5 cm. longa et 1·5 cm. lata, brevissime petiolata, supra nitida, infra dense adpresse albo-tomentosa, juniora supra pubescentia, nervis obscuris. *Flores* in racemos terminales vel axillares trifloros dispositi, bibracteolati, pedunculis 1–2 mm. longis, adpresse albo-tomentosis suffulti. *Sepala* 5, triangularia, 1·5 mm. longa, dorso adpresse albo-tomentosa. *Petala* 5, patentia, oblonga, 5 mm. longa, apice breve acuminata incurvata, flava, ima basi intra squamula in segmenta 3–5 divisa instructa. *Stamina* 5; filamenta glabra 2 mm. longa; antherae 1·5 mm. longae. *Discus* carnosus, glaber, integer, aurantiacus. *Receptaculum* turbinatum, albo-tomentosum. *Ovarium* uniloculare, ovulis solitariis; stylus 3 mm. longus, stigmate capitato obscure trilobato. *Fructus* adhuc ignotus.—W. B. Turrill.

The genus *Corokia*, of which the species most familiarly known in English gardens, *C. Cotoneaster*, Raoul, has been already figured in this volume at t. 8425, is endemic in New Zealand. The other previously described species are *C. buddleoides*, A. Cunn., and *C. macrocarpa*, T. Kirk. But in his Manual of the New Zealand Flora, Mr. Cheeseman notes that what may prove to be a fourth species of *Corokia* has been collected by himself at Spirit's Bay in the North Cape district. This plant Mr. Cheeseman describes as a twiggy bush, six to twelve feet high, with slender branches which are not tortuous, and with alternate leaves one half to one and a half inch long, which are narrowly linear-obovate or oblanceolate contracted at the base into very short petioles. It is, therefore, just possible that the species encountered by Mr. Cheeseman, of which he failed to obtain flowers, is that now for the first time described. The material for our plate has been supplied from a plant which has been in cultivation at Kew since 1907, when it was raised from a cutting received from the editor of the Gardeners' Chronicle, to whom it had been submitted by a correspondent for identification. The precise history of its introduction to horticulture is therefore unknown. *C. virgata* is undoubtedly very nearly allied to *C. Cotoneaster*, but is distinguishable at a glance by its slender straight branches and its larger leaves. Another differential character which appears to be constant is to be found in the scales at the base of the petals; these organs in our plant are divided almost to the base into a few narrow segments, in *C. Cotoneaster* they are delicately fimbriate on the margin but have a broad undivided base. As grown at Kew *C. virgata* is now a shrub about eight feet high, which thrives well and flowers freely in the Himalayan section of the Temperate House. But although this situation is necessary at Kew, it is probable that in the warmer parts of the British Isles, where the other species of *Corokia* are known to thrive, this species also may be found hardy out of doors.

DESCRIPTION.—*Shrub*, about 8 ft. high, virgately branched; twigs terete not divaricately twisted, when young white-tomentose, but soon glabrous and dark brown. *Leaves* very shortly petioled, alternate, oblong-spathulate, acute, up to 1¾ in. long, ⅔ in. wide, shining above, closely adpressed white-tomentose beneath, pubescent above when young; veins indistinct. *Flowers* in terminal and axillary 3-flowered racemes, 2-bracteolate; peduncles 1 lin. long or less, adpressed white-tomentose. *Sepals* 5, triangular under 1 lin. long, adpressed white-tomentose outside. *Petals* 5, spreading, oblong, 2½ lin. long, with shortly acuminate incurved tips, yellow, each with a basal scale completely divided into 3–5 segments. *Stamens* 5; filaments glabrous, 1 lin. long; anthers rather shorter than the filaments. *Disk* fleshy, glabrous, entire, orange-yellow. *Receptacle* turbinate, white-tomentose. *Ovary* 1-celled; ovule solitary; style 1½ lin. long; stigma capitate, faintly 3-lobed. *Fruit* not seen.

Fig. 1, a flower; 2, a hair; 3, vertical section of calyx and pistil; 4, petal, showing basal scale; 5, a scale; 6 and 7, anthers:—*all enlarged*.

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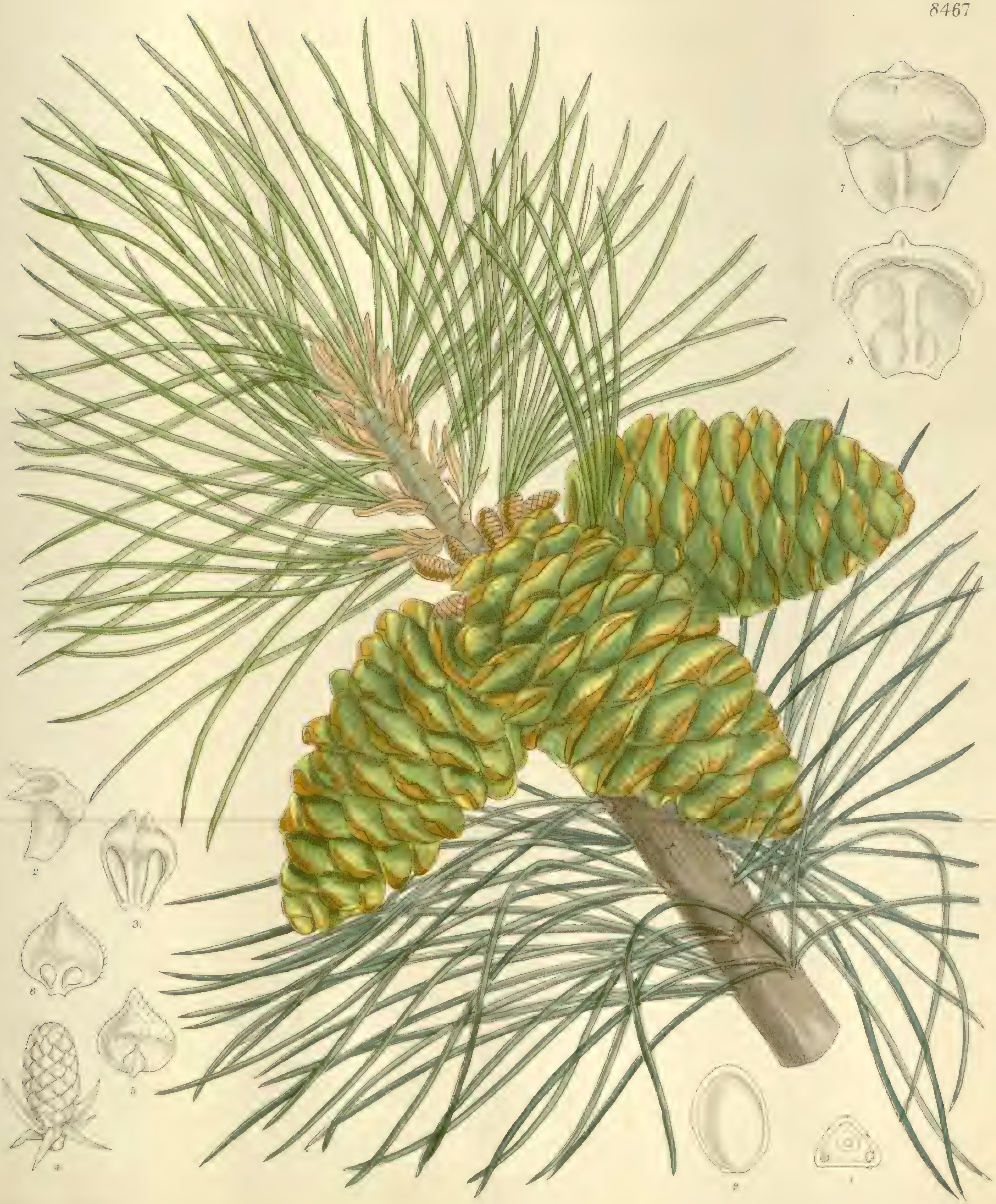

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TAB. 8467.

PINUS FLEXILIS.

Western North America.

CONIFERAE. Tribe ABIETINEAE.

PINUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 438.

Pinus flexilis, *James in Long's Expedition*, vol. ii. p. 34; *Sargent in Silva North Amer.* vol. xi. p. 35, tt. 546, 547; *Henry in Elwes & Henry, The Trees of Great Britain and Ireland*, p. 1046; species *P. albicauli*, Engelm., proxime affinis sed innovationum ramulis cinereis nec rubescentibus strobis apertis et seminibus argute marginatis differt.

Arbor, saepius 12-15-metralis, nonnunquam 25-metralis; in aridis montium cacuminibus interdum fruticosus, 3–6 dm. altus; ramuli juniores laevissimi, glabri vel minutissime pubescentes. *Folia* glomerulis 5-foliatis aggregata, diu persistentia, vetustiora quinquennalia vel septuennalia, juniora saepe ad ramulos plus minusve appressa, triangularia, curvata, apice acicularia, margine integerrima, 5–9 cm. longa, 1·25 mm. lata, cinerascentes, utrinque lineis stomatum 3–4 notata. *Strobi* ovoidei, 7·5–10 cm. longi, 4–5 cm. lati, singuli vel bini vel terni, sessiles; squamae late ovatae, 1·2–2·5 cm. longae, 1–2 cm. latae, intus cinereae, margine libera pallide brunneae, deflexae, crasse mucronatae. *Semina* ovoidea, complanata, margine unilateraliter vel utrinsecus acutata, 1 cm. longa, ala subobsoleta. —W. J. BEAN.

The Pine here figured, *Pinus flexilis*, is extremely rare in British pineta, and the only good specimens we know of are two trees in Lord Rayleigh's grounds at Terling Place, Essex, and a group of four trees in the Kew pinetum from the largest of which the material for the preparation of our plate was obtained. So far as is generally known, this is the finest example in the British Isles; it measures at the present time 33 feet in height and 3 feet in girth of trunk. The group of trees at Kew is situated just within the Isleworth Ferry Entrance, and was planted there by Sir Joseph Hooker at the time of the formation of the pinetum, 1871–1872; the plants had been obtained from the firm of Dickson & Turnbull, Edinburgh. The species was discovered in Colorado near the base of Pike's Peak in 1820, and was introduced to cultivation in 1861, by Dr. Parry.

There are three characters which, in conjunction, distinguish *P. flexilis* from all other pines in cultivation whose leaves are five in a bundle: the entire margins of the

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leaves, the deciduous leaf-sheaths and the glabrous young shoots. It is most closely allied to *P. albicaulis*, which has also entire leaf-margins and deciduous leaf-sheaths, but has reddish pubescent young shoots and indehiscent cones with much thickened, triangular, pointed scales.

As a tree for garden and park, *P. flexilis* is worth growing for its distinct appearance. Its branches are upturned at the ends, rather candelabra-like; the leaves are often pointed forwards more than is shown in the plate; this, in conjunction with the sparse branching, produces a slender form. The species is widely spread and forms extensive forests in Western N. America, reaching its largest size on the mountains of Northern New Mexico and Arizona. It thrives very well in the indifferent soil and atmosphere of Kew, and whilst its growth is not rapid—under a foot a year—the trees are very healthy. It has hitherto been propagated by imported seeds.

DESCRIPTION.—*Tree*, ordinarily 40–50 ft., sometimes 80 ft. high, but sometimes also reduced to mere scrub a foot or two high on bleak mountain-tops; young branchlets perfectly smooth and glabrous in the tree figured, but sometimes in a wild state covered with minute pubescence. *Leaves* in bundles of fives, persisting for 5–7 years, the younger ones often somewhat appressed to the branch, triangular in section, sharply pointed, curved, margins entire, 2–3$\frac{1}{2}$ in. long, $\frac{1}{20}$ in. wide, grey-green with 3–4 lines of stomata on each face. *Cones* ovoid, 3–4 in. long, 1$\frac{3}{4}$ in. wide, solitary or in pairs or threes, sessile; scales broadly obovate, $\frac{1}{2}$–1 in. long, $\frac{2}{5}$–$\frac{3}{4}$ in. wide, grey within, the exposed margin pale brown, deflexed, tipped by a stout mucro. *Seeds* ovoid, flattened to a sharp edge on one or both sides, about $\frac{1}{3}$ in. long, with only a rudimentary wing.

Fig. 1, transverse section of a leaf; 2 and 3, stamens; 4, female cone in flower; 5 and 6, bract and scale; 7, fruit scales; 8, seed:—*all enlarged.*

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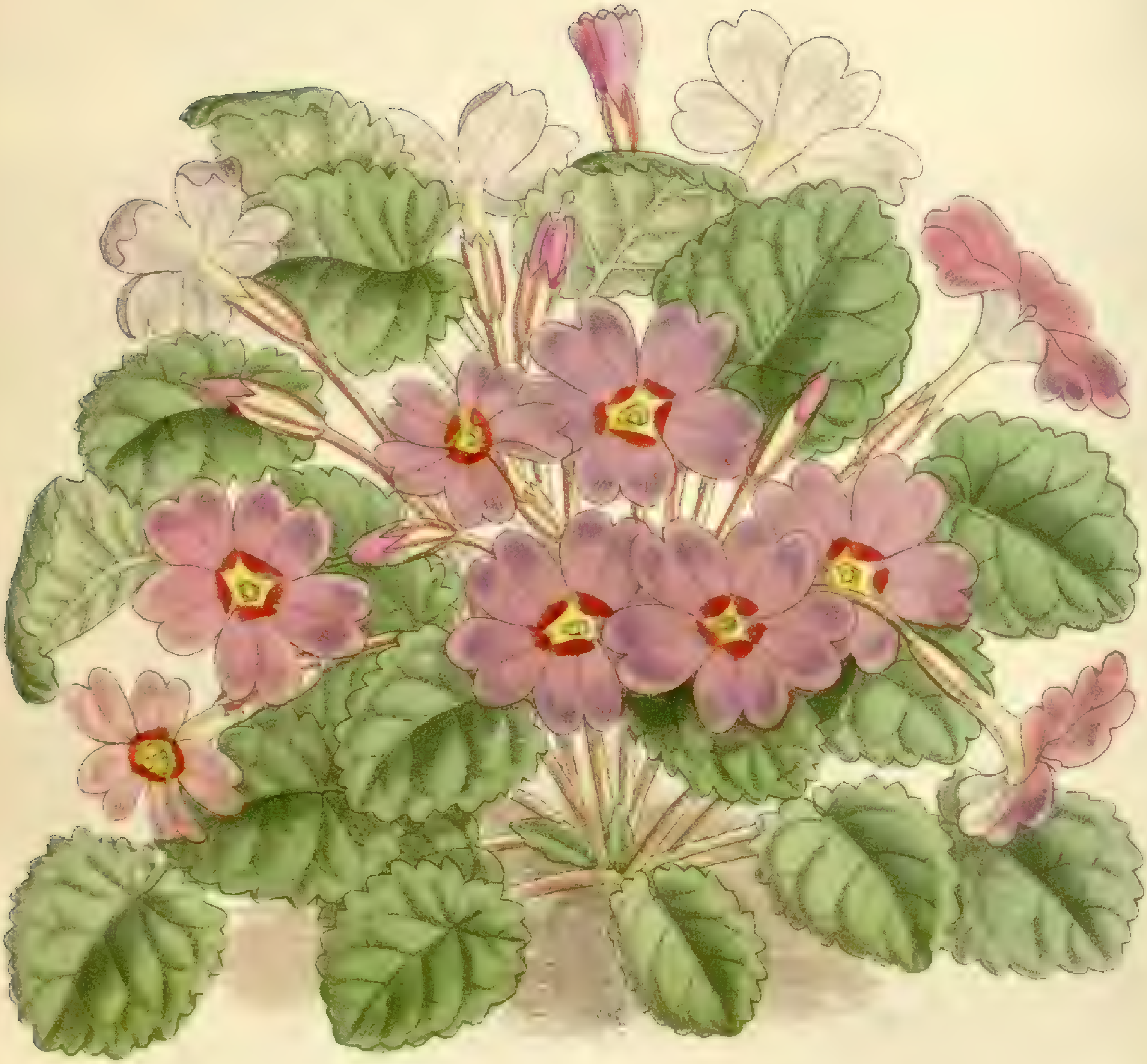

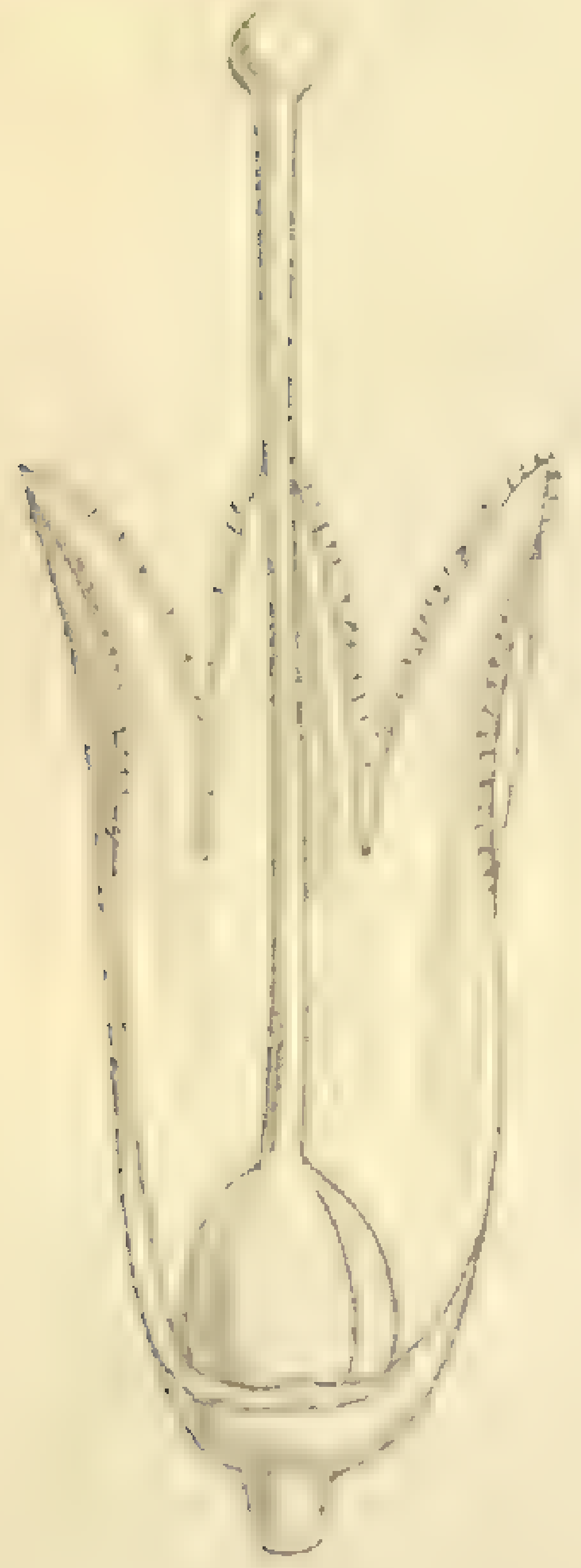

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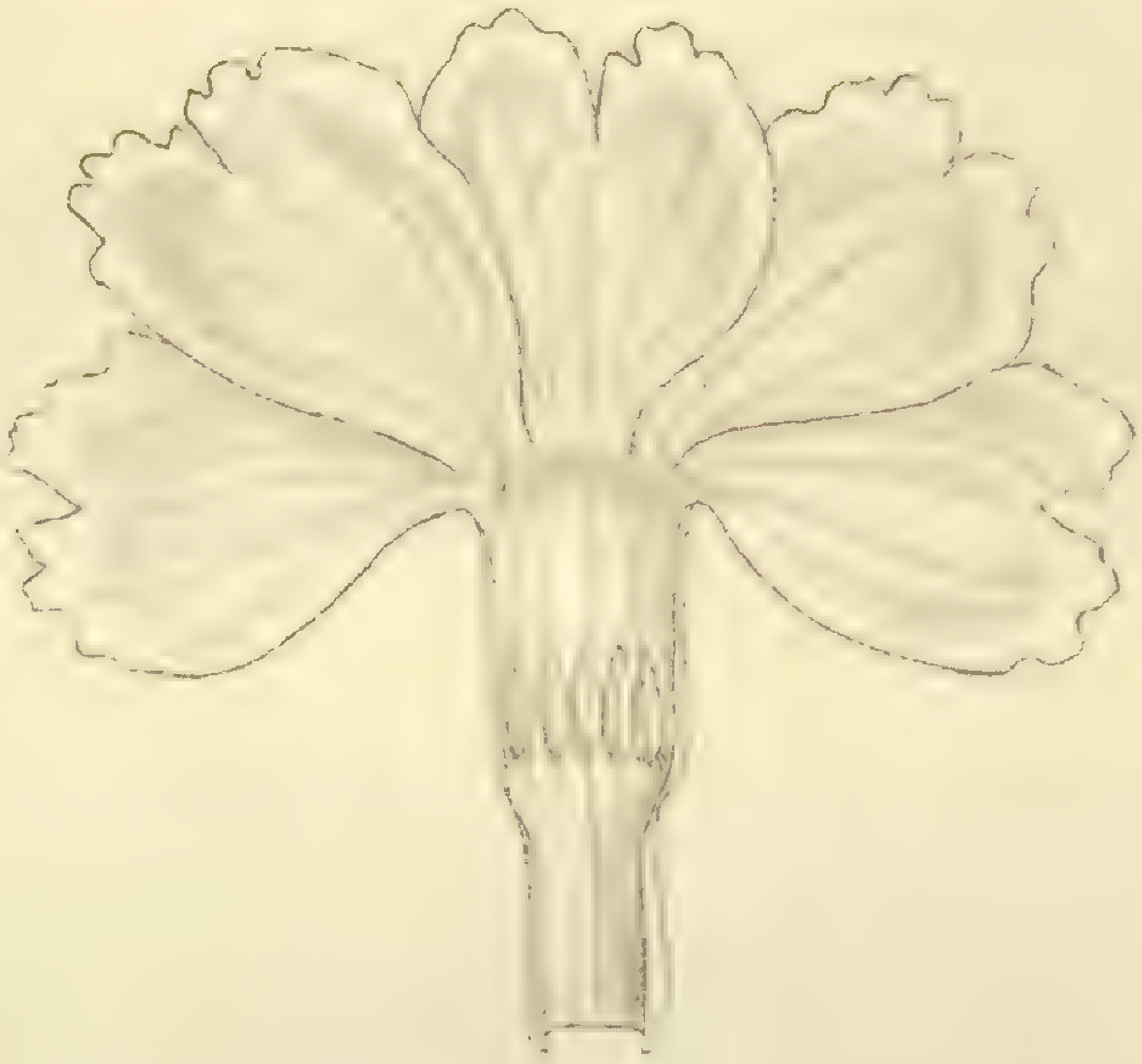

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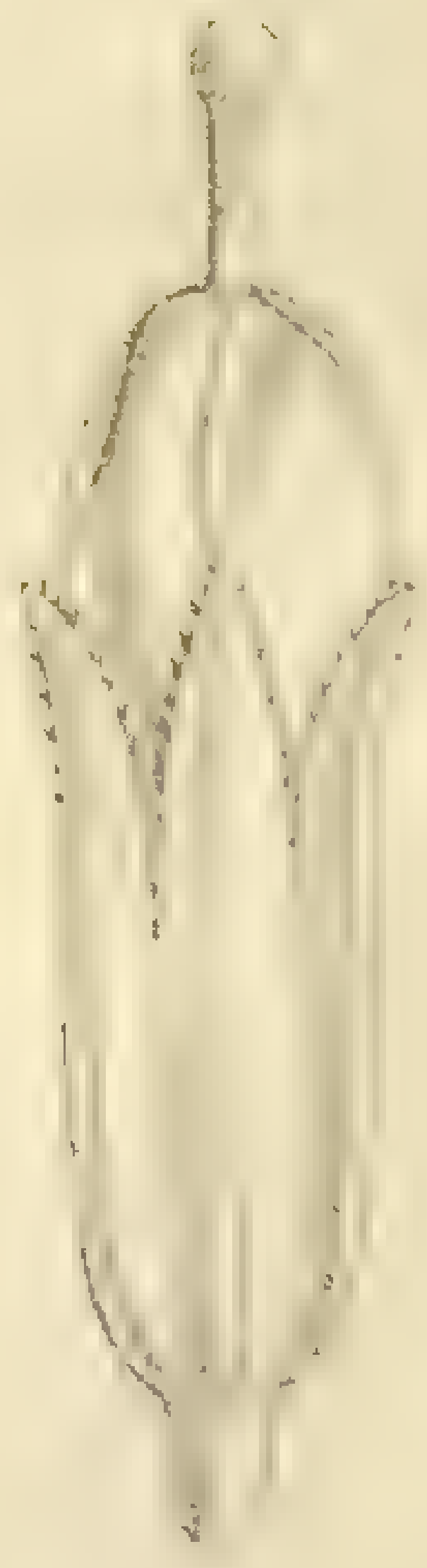

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Tab. 8468.

PRIMULA Juliae.

Transcaucasia.

Primulaceae. Tribe Primuleae.

Primula, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 631.

Primula Juliae, *Kusnezow in Act. Hort. Jurjev.* vol. i. p. 67 *et Fl. Cauc. crit.* vol. iv. p. 75; *Pax et Knuth in Engler Pflanzenr. Prim.* p. 56; *Irving in Gard. Chron.* 1912, vol. li. p. 293, cum ic.; a *P. acaule*, Linn., foliis reniformi-orbicularibus basi cordatis longe petiolatis, corollae colore diverso tubo calycem fere duplo superante recedit.

Herba perennis. *Folia* reniformi-orbicularia, basi cordata, margine grosse crenata, plerumque circiter 3 cm. diametro, nervis lateralibus utrinque 5 supra immersis subtus prominentibus, pagina utraque glabra, petiolo ad 7 cm. longo subalato inferne gradatim incrassato rubro-lineolato glabro adjecto. *Scapus* deficiens; pedicelli numerosi, folia subaequantes, ut petioli rubro-lineolati, glabri. *Calyx* anguste tubulosus, angulatus, 1 cm. longus, vix ad medium lobatus; lobi angusti, lanceolati, acutiuscule acuminati, ciliolati. *Corollae* tubus ad 1·7 cm. longus, limbus ad 3 cm. diametro fauce sulfureo, lobis obcordatis ad 1 cm. latis saepissime irregulariter pauci-dentatis. *Antherae* apiculatae, 1·5 mm. longae. *Ovarium* 2 mm. altum; stylus ante anthesin exsertus, stigmate capitato.—W. G. Craib.

The pleasing *Primula* which forms the subject of our illustration is a Transcaucasian species for the introduction of which horticulture is indebted to Professor Kusnezow, Director of the Botanic Garden at Dorpat, by whom it was sent from Dorpat to various institutions in this country, including the Botanic Garden at Oxford and the Royal Botanic Gardens at Kew. The plants at Oxford proved hardy, planted out in a sheltered border, during the winter of 1911–12, and flowered freely in April, 1912. The plants at Kew, which were received from Dorpat early in the spring of 1912, flowered at the same time as those at Oxford. From one of these Kew specimens was obtained the material from which our figure was drawn. This figure shows a deviation in one respect from the plant on which Professor Kusnezow based his original description, for he has described the flower-stalks as being twice to thrice as long as the leaves, whereas in the plants grown in this country the flower-stalks have been hardly, if at all, longer than the leaves. In describing the species Mr. Craib has

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compared *P. Juliae* with *P. acaulis* owing to the fact that in neither of the two is a scape developed. But while they agree in this regard, and while in habit they have much in common, Mr. Craib remarks that they differ very greatly in leaf; they may be compared because they are similar, but it is doubtful if they can be spoken of as really closely allied. *P. Juliae* is a species which it is easy to propagate by means of seeds and still easier to multiply by division of the stolon-like growths which are produced from the main-stem.

DESCRIPTION.—*Herb*, perennial. *Leaves* reniform-orbicular, base cordate, margin coarsely toothed, usually rather over 1 in. across, lateral nerves about 5 on each side, sunk above, raised beneath, glabrous on both surfaces; petiole up to 3 in. long, slightly winged, gradually thickened downwards, glabrous, streaked with red. *Scape* 0; pedicels many, as long as the leaves, streaked with red and glabrous like the leaf-stalks. *Calyx* narrowly tubular, angled, 5 lin. long, lobed less than half-way down; lobes narrow-lanceolate, rather acutely acuminate, ciliolate. *Corolla* tube over $\frac{2}{3}$ in. long, limb up to $1\frac{1}{4}$ in. across, throat sulphur-yellow, lobes obcordate, up to 5 lin. wide, often irregularly sparingly toothed. *Anthers* apiculate, under 1 lin. long. *Ovary* 1 lin. long; style exserted before the flower opens; stigma capitate.

Fig. 1, bud; 2, calyx, in section, showing pistil; 3, corolla, laid open, showing anthers:—*all enlarged.*

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TAB. 8469.

AKANIA HILLII.

Australia.

AKANIA, *Hook. f.*; *Benth. et Hook. f. Gen. Plant.* vol. i. pp. 409, 1000; *Stapf in Kew Bulletin*, 1912, p. 379.

Akania Hillii, *Hook. f. in Benth. et Hook. f. Gen. Plant. l.c.*; *Benth. Flor. Austral.* vol. i. p. 471; species unica.

Arbor 9–12-metralis inflorescentiis exceptis glabra, ramis junioribus pallide brunneis lenticellis verrucosis. *Folia* imparipinnata, 30–60 (rarius ad 90) cm. longa; rhachis robusta, teres, pallida; foliola opposita vel rarius alterna, utrinque 6–15, petiolulo basi apiceque incrassato 4–10 mm. longo suffulta, lanceolata, acuminata, spinuloso-serrata, 12–30 cm. longa, 1·75–3·5 cm. lata, coriacea, utrinque lucida, exsiccando saltem glaucescentia, nervis utrinsecus 15–20, prope marginem arcuato-connectis prominentibus, venis imprimis subtus prominulis eleganter anastomosantibus, areolis ob papillas foveolas stomata recipientes densissime vestientes subtus albo-maculatis. *Paniculae* axillares vel supra-axillares vel interdum e ligno vetusto ortae, amplae, 30–45 cm. longae, floribundae, praeter rhachin basi tandem glabratam dense pubescentes; pedicelli 6–8 mm. longi, graciles; bracteae minutae, ovatae vel lanceolatae. *Flores* odorati. *Calyx* deciduus, 5-sepalus, cum receptaculo haud alto obovoideus, 3–4 mm. longus; receptaculum extra pubescens intus basi dense sericeum; sepala inaequalia, imbricata, rotundato-ovata, obtusa, praeter cilia minuta marginalia magis minusve glabrescentia. *Petala* 5, dextrorsum vel sinistrorsum contorta, obovato-oblonga, basi subunguiculata, alba vel (spontanea) pallide rosea, 8–10 mm. longa. *Stamina* plerumque 8, rarius 9, epipetala 3–4 imo calycis fundo, episepala (exteriora) 5 paulo altius inserta; filamenta glabra, filiformia, ad 4 mm. longa; antherae oblongae, basifixae, lateraliter dehiscentes; pollen tetraedrico-globosum, poris 4, exine minutissime granulata. *Ovarium* oblongo-obovoideum, tomentellum, in stylum columnarem 4–5 mm. longum basi pubescentem abiens; stigma minute 3-lobum; loculi 3, 2-ovulati; ovula superposita, anatropa, micropyle supera, rhaphe ventrali. *Fructus* capsularis, loculicide dehiscens, ovoideus vel pyriformis, 2–2·25 cm. longus, valvis coriaceo-lignosis, fuscis. *Semina* in quoque loculo 2 vel 1, ellipsoideo-globosa vel, si duo, contactu applanato-truncata, 10 mm. longa, 8 mm. lata; testa crustacea, pallida, interdum maculata; hilum oblongum, impressum; tegmen tenue, solutum; albumen secundum cotyledonum margines tenue, caeterum crassum, carnosum, amygdalos amaros redolens; embryo amplus; cotyledones crassae, subplanae; radicula brevis, plumula minuta.—*Cupania lucens*, F. Muell. Fragm. vol. iii. p. 44. *Lomatia Bidwillii*, Kew Hand-list Tend. Dicot. p. 415.—O. STAPF.

The interesting and striking plant which forms the subject of our illustration is a native of Australia and is the representative of a monotypic genus of singularly isolated character. The plant in question was received at Kew in 1872 from Mr. Linden, from whose nursery at Ghent it was issued under the name *Lomatia Bidwillii*. At Kew it has been grown in an open border in the Mexican

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House, where it has thriven well and has developed into a graceful tree twenty feet or so in height. During the forty years which have elapsed since its arrival, the tree had made no attempt to flower until February, 1912, when its striking inflorescences were developed from the hard, woody stem, and proved that the plant was not a *Lomatia* but was *Akania Hillii.* The difficulties that attend the reference of the genus *Akania* to its proper natural family have been fully discussed by Dr. Stapf in an interesting note in the Kew Bulletin for 1912, pp. 378–9, where the extraordinary diversity of view to which its characters have given rise is clearly displayed. But, whatever its most natural position may be, *A. Hillii*, whether as grown for its foliage only or when it rewards the patience of a generation by developing its blossoms, is from the cultural standpoint a species well worthy of a place in a roomy greenhouse.

DESCRIPTION.—*Tree*, 30–40 ft. high, glabrous except the inflorescence. *Leaves* unequally pinnate, 1–2 ft., rarely 3 ft. long; rachis stout; leaflets opposite or occasionally alternate, 6–15 on each side, lanceolate, acuminate, spinulose-serrate, 5–12 in. long, $\frac{2}{3}$–$\frac{1}{2}$ in. wide, coriaceous, shining on both sides, nerves 15–20 on each side, anastomosing near the margin, finely reticulated beneath, with white foveolate papillae within each areola; petiolules 2–5 lin. long. *Panicles* axillary, or supra-axillary, or from the old wood, 1–1$\frac{1}{2}$ ft. long, lax but little branched, pubescent except the base of the rachis; pedicels slender, $\frac{1}{4}$–$\frac{1}{3}$ in. long. *Sepals* 5, deciduous, 2 lin. long, somewhat unequal, rounded, obtuse; margins ciliate, elsewhere nearly glabrous. *Petals* 5, contorted, obovate-oblong, clawed, white or (in wild plants) pale rose, 4–5 lin. long. *Stamens* usually 8, rarely 9, 3–4 epipetalous inserted at the base of the calyx, 5 (outer) episepalous inserted higher up; filaments glabrous; anthers oblong. *Ovary* ovoid-oblong, 3-celled, contracted into a thickened style; stigma minutely 3-lobed; ovules 2 in each cell superposed. *Fruit* a capsule, $\frac{3}{4}$ in. long, dehiscing loculicidally; valves finely coriaceous. *Seeds* 1–2 in each cell, ellipsoid globose or truncately flattened, 5 lin. long, 4 lin. wide; testa crustaceous.

Fig. 1, floral diagram; 2, bud; 3, flower in vertical section; 4 and 5, anthers; 6, ovary in vertical section:—*all enlarged.*

8170.

M.S. del. J.N. Fitch lith.

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Tab. 8470.

LISSOCHILUS Andersoni.

Tropical West Africa.

Orchidaceae. Tribe Vandeae.

Lissochilus, *R. Br.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 536.

Lissochilus Andersoni, *Rolfe in Kew Bulletin*, 1910, p. 159; a *L. Milsoni*, Rolfe, sepalis lateralibus et labello brevioribus differt.

Herba terrestris. *Rhizoma* moniliforme articulis ovoideo-incrassatis 2–3 cm. latis. *Folia* 2, elongato-lanceolata, acuminata, recurva, plicata, 25–30 cm. longa, 2–3 cm. lata, basi erecta, angusta et conduplicata. *Scapi* erecti, circiter 50 cm. alti, basi vaginis paucis lanceolatis obtecti; racemi laxi, 4–5-flori. *Bracteae* deltoideo-lanceolatae, acuminatae, 1–1·4 cm. longae. *Pedicelli* 1·5–2 cm. longi. *Flores* 2–2·3 cm. longi, pallide sulfurei. *Sepala* subpatentia, lineari-lanceolata, acuta, 2–2·5 cm. longa; lateralia apice subfalcata. *Petala* erecta, parallela, elliptico-oblonga, subobtusa, 2 cm. longa, 1 cm. lata. *Labellum* 3-lobum, 2·5 cm. longum; lobi laterales late oblongi, obtusi vel truncati, erecti, 1·2 cm. longi; lobus intermedius suborbicularis, obtusus, margine undulato et lateribus recurvis; discus carinis 5–7 verrucosis pallide purpureis instructus; saccus conicus, obtusus, 4–5 mm. longus. *Columna* clavata, subcompressa, 1·2 cm. longa; anthera apiculata; pollinia 4, per paria plus minusve concreta, cerea, anthera dehiscente stipiti brevi glandulae latiusculae affixa.—R. A. Rolfe.

The African orchidaceous genus *Lissochilus* is a large one; about one hundred species have been described. Many of these have been introduced into cultivation, but few of them thrive after the first year or two, owing to exhaustion following the act of flowering. This in turn is largely owing to the difficulty attending the imitation of the conditions under which most of the species naturally grow. The majority are found in open sunny positions which are converted into swamps during the rainy season, when the plants are in growth and produce flowers. These swamps during the hot season are completely dried up, and at this time the species of *Lissochilus* die down to a fleshy subterranean tuberous rootstock. *L. Andersoni*, the species which forms the subject of our plate, is a native of such localities on the Gold Coast, which has been collected at Aburi by Mr. J. Anderson and on the Afram plain by Mr. W. H. Johnson. A plant received at Kew from Mr. Anderson in 1908 flowered in the Orchid collection

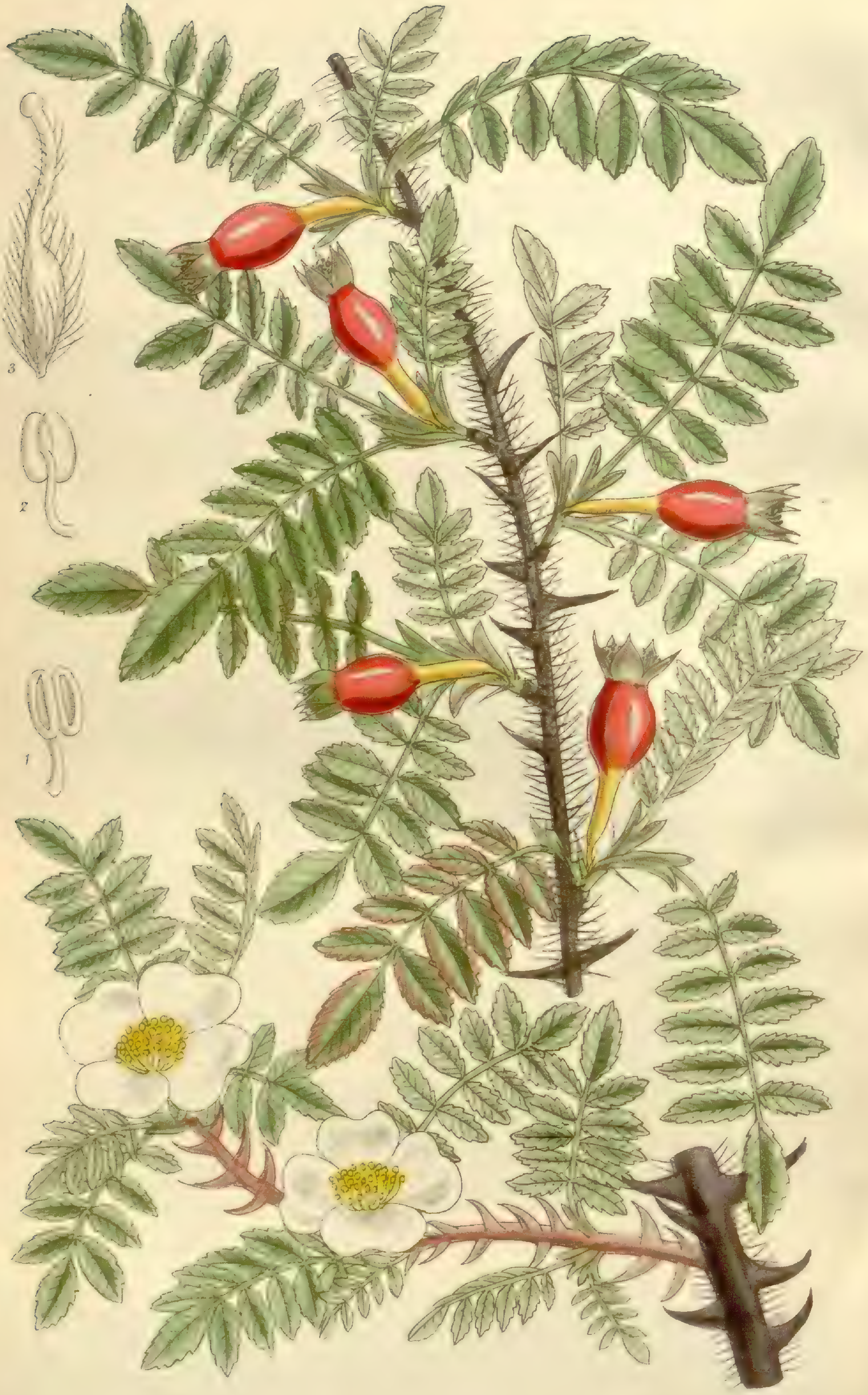
December, 1912.

in April, 1910, when our figure was prepared. In the genus our species is most nearly allied to *L. Millsoni*, Rolfe, one which has not yet been introduced to cultivation, and to *L. purpuratus*, Lindl., figured at t. 7921 of this work. Though the natural conditions cannot be reproduced, it is found that a *Lissochilus* thrives best when grown under stove conditions, fully exposed to strong sun, in a compost consisting of good turfy loam, leaf mould and sand in equal proportions. Abundant water and liberal treatment with cow manure is needed during the growing period; after flowering is over the plant should be gradually dried off, and the tubers stored at a temperature of 50°–60° F. until the following spring.

DESCRIPTION.—*Herb*, terrestrial; rootstock moniliform, the segments ovoid, $\frac{3}{4}$–$1\frac{1}{4}$ in. thick. *Leaves* 2, narrow-lanceolate, acuminate, recurved, plicate, 10–12 in. long, $\frac{3}{4}$–$1\frac{1}{4}$ in. wide, narrow, erect and conduplicate below. *Scapes* erect, about $1\frac{1}{2}$ ft. high, with a few lanceolate basal sheaths; racemes laxly 4–8-flowered; bracts deltoid-lanceolate, acuminate, 5–7 lin. long; pedicels $\frac{2}{3}$–$\frac{3}{4}$ in. long. *Flowers* $\frac{3}{4}$–1 in. long, pale sulphur-yellow or greenish-yellow. *Sepals* somewhat spreading, linear-lanceolate, acute, $\frac{3}{4}$–1 in. long; the lateral pair subfalcate at the tip. *Petals* erect, parallel, elliptic-oblong, somewhat obtuse, $\frac{3}{4}$ in. long, over $\frac{1}{3}$ in. wide. *Lip* 3-lobed, 1 in. long; lateral lobes wide-oblong, obtuse or truncate, erect, $\frac{1}{2}$ in. long; mid-lobe suborbicular, obtuse, the margin undulate and the sides recurved; disk with 5–7 pale-purple warted ridges; spur sac-like, conical, blunt, 2–3 lin. long. *Column* clavate, somewhat compressed, $\frac{1}{2}$ in. long; anther apiculate; pollen-masses 4, more or less joined in pairs, when the anther opens attached by a short stipe to a rather broad gland.

Fig. 1, column; 2 and 3, pollinia with stipes and gland, seen from back and front; 4, subterranean tuber:—*all enlarged except* 4, *which is of natural size.*

8471.



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TAB. 8471

ROSA OMEIENSIS.

Western China.

ROSACEAE. Tribe ROSEAE.

ROSA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 625.

Rosa omeiensis, *Rolfe*; affinis *R. sericeae,* Lindl., sed foliolis plurimis et angustioribus, floribus saepissime minoribus et fructus pedicellis incrassatis et flavis differt.

Frutex robustus, ramosus, 1–3 m. altus. *Ramuli* juniores saepius dense setulosi, vetusti glabri, aculeis validis stipularibus e basi dilatata compresse subulatis subrectis armati. *Folia* 3–6 cm. longa, viridia, 9–13-foliolata; foliola oblonga vel elliptico-oblonga, argute serrulata, 1–2 cm. longa, 3–7 mm. lata, rhachis parce aculeolata, glabra, subtus pallidiora. *Stipulae* petiolo adnatae, 6–8 mm. longae, basi angustae, apice dilatatae, acutae, argute dentatae. *Flores* in ramulis brevibus lateralibus solitarii, albi, circiter 3 cm. diametro. *Pedunculi* graciles, 1–2 cm. longi. *Receptaculum* ellipsoideum, glabrum. *Calycis* lobi deltoidei, acuti vel acuminati, integri, 8–10 mm. longi, basi 3–4 mm. lati, villosuli. *Petala* saepissime 4, obcordato-orbicularia, circiter 1·5 cm. lata. *Stamina* 3–4 mm. longa; filamenta glabra; antherae late oblongae. *Carpella* oblonga, pilosa; styli liberi, brevissime exserti, pilosi. *Fructus* ellipsoideus, 1–1·3 cm. longus, saturate ruber, pedicelli 1–1·3 cm. longi, incrassati, flavi.—R. A. ROLFE.

The Rose here figured may be regarded as the Eastern representative of the Himalayan *Rosa sericea*, Lindl., which has been figured at t. 5200 of this work. But *R. omeiensis* differs markedly from *R. sericea* by its more numerous, relatively narrower leaflets, its usually considerably smaller flowers and in the thickened yellow fruiting pedicels. It was first discovered a quarter of a century ago by the Rev. E. Faber on Mount Omei, Szechuan, at about 8,000 ft. above sea-level. Later it was met with in the same neighbourhood and also on the Fang Mountains, Hupeh, by Mr. A. Henry, who has described it as a large spreading bush, 6 to 10 ft. high, forming thickets on the mountains at elevations of from 8,000 to 9,500 ft. For the introduction of *R. omeiensis* to this country, horticulture is indebted to Messrs. J. Veitch & Sons, through their collector, Mr. E. H. Wilson, who met with the species both on Mount Omei and on the Fang range, and records it as occurring at elevations of from 4,000 to 10,000 ft. elevation. With

Messrs. Veitch it flowered and fruited in 1908, and provided the material from which our illustration has been prepared. Judging by the manner in which it grows in their nursery at Coombe Wood, *R. omeiensis* appears to be as hardy and vigorous as its ally, *R. sericea.* It has the same elegant, much divided foliage, which imparts to the whole plant a fern-like grace, while the yellow stalks of the fruits add a curious and striking feature to the plant in autumn. It thrives in good loamy soil, and the seeds it bears so freely will afford an easy means of propagation. According to Faber, the fruits are eaten in China, and have a pleasant acid taste.

DESCRIPTION.—*Shrub*, 3–10 ft. high, freely branching, the young shoots usually densely setulose, the older shoots glabrous, armed with stout stipular subulate spines which are nearly straight and are somewhat flattened and wide-based. *Leaves* 1¼–2½ in. long, green, 9–13-foliolate; leaflets oblong or elliptic-oblong, sharply toothed, ⅓–¾ in. long, ⅛–¼ in. wide, rachis sparingly prickly, glabrous, rather pale on the under surface; stipules adnate, ¼–⅓ in. long, narrowed at the base, dilated at the apex, acute, sharply toothed. *Flowers* solitary on short lateral twigs, white, over 1 in. in diam.; peduncles slender, ⅓–¾ in. long. *Receptacle* ellipsoid, glabrous. *Calyx-lobes* deltoid, acute or acuminate, entire, ⅓ in. long or longer, somewhat villous. *Petals* usually 4, obcordate-orbicular, about ⅔ in. broad. *Stamens* ⅛–⅙ in. long; filaments glabrous; anthers wide-oblong. *Carpels* oblong, pilose; styles free, shortly exserted, pilose. *Fruit* ellipsoid, ⅓–½ in. long, bright red; pedicels ⅓–½ in. long, thickened, yellow.

Figs. 1 and 2, stamens; 3, carpel:—*all enlarged.*

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